The Builder.

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Gate-Lodge and Stabling, Chertsey.—Messrs. Wimperis and Arber, Architects ..... *Single-Page Ink-Photo.*
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Architectural Drawings at Paris.

THE architectural drawings at the old Salon in the Palais de l'Industrie are less numerous than usual. The three usual rooms are filled, but the drawings in the gallery round the central hall, instead of extending as usual nearly round three sides of the hall, only fill one end and half the side. Whether this is to any extent due to some of the architects having been enticed away to the opposition Salon we cannot conclude till we see what the latter has to show us. It cannot be on account of the jury having taken a higher standard than before, for in fact the exhibition is below the average in quality as well as quantity.

As usual, the largest and most elaborate collection of drawings consists of restorations. Of these the *pièce de résistance* is M. Defrasse's "Restauration de l'Enceinte Sacrée d'Epidaure." He shows a plan, and a careful geometrical drawing of the existing remains, and below it an elevation of the restoration, on a very large scale and carefully coloured. M. Defrasse shows the circular temple (*Tholos*) with a sloping roof above the colonnade, and the upper part of the *cella* wall rising out of it, and decorated with a frieze of white figures on a blue ground. The appearance of this upper drum of masonry rising out of the tiled roof impresses us as not very good and not very Greek. Both the Tholos and the Temple of Asclepios are shown with very strong blue on the triglyphs and on the ground of the tympanum of the latter; the metope spaces are filled up with immense painted rosettes, which again do not look very Greek. A series of photographs of fragments of architecture and sculpture from the ruins is appended, as representing the documents on which the restoration is based, but it does not of course cover all the details.

We have also this year again a prominent piece of Oriental restoration, that of the royal pagoda of Vât-cheng, the drawings of which are part of the result of a mission sent out by the Department of Public Instruction. This set of drawings is by M. Fournereau, and does credit certainly to his industry and thoroughness of workmanship. The immense geometrical elevation of the pagoda shows a great central steeple or minaret with a pyramidal base, and a similar but smaller erection at each angle. The forms are barbarous, but the drawing is beyond praise, and the whole surface of this vast elevation is covered with coloured decorative detail, all carefully indicated. Of some of this decorative detail, and of the grotesque figures which are painted on the walls, there are careful and brilliantly coloured drawings to a larger scale.

M. Bauhain exhibits a large set of drawings, beautifully tinted in Indian-ink, of the château of Rochefoucauld, showing its actual state and a restoration as it may have been at the Renaissance period. This is, in fact, a restoration of a restoration, for the author gives drawings as the castle was in the fifteenth century, and drawings of its Renaissance renewal and alteration. In the former period it was an irregularly-planned château, with the usual great circular turrets at the angles, and a massive square machicolated tower at one point, dominating the whole, the curtain walls being nearly blank masses, only pierced near the top: the main change in the Renaissance version of the building being, of course, the introduction of a large number of regularly-spaced windows with pilasters and other adornments. This is a very fine set of drawings, but most English architects would be inclined to question whether there was anything in their archæological and architectural value commensurate with the space they occupy.

Among other drawings of ancient work (we are confining our remarks at present to the drawings in the three rooms, omitting those in the gallery) may be mentioned M. Boutron's measured and restored elevation of the "Jubé" of Limoges Cathedral, a curious piece of work, looking exceedingly Gothic in general character, while every detail is in fact of Renaissance type. Gothic cuspings to the arches are imitated by a succession of curved appendages, not springing out of the arch-mould as Gothic cusping does, but merely as if stuck on to it. This is vile in itself, but is interesting as a bit of character. The drawing is beautifully executed, a large-scale elevation delicately tinted in Indian-ink. M. Rouillard exhibits some coloured drawings of the paintings in the ancient cloister of Nôtre-Dame d'Abondance (Haute-Savoie), which are from the archives of the Commission des Monuments Historiques. A very interesting collection of drawings is that by M. Henri Deverin of a curious seventeenth-century building, the Abbaye of Celles. There appears to have been some Gothic work left amid the seventeenth-century construction, for one drawing shows a piece of Gothic. vaulting (in the vestibule and staircase), with a Renaissance column built up so as to support the groin-rib in the middle of its length, where it had evidently shown signs of failure; one of the oddest architectural combinations we remember to have seen. The principal façade of the building is a curious piece of work, showing narrow flat pilasters, which at the base are projected out into tolerably deep buttresses, the transition being effected by introducing a scroll or console at the foot of the pilaster. The elevation of the side pavilion shows a powerful piece of simple classic design; the wall is rusticated throughout, and the large flat projections along it are treated with an Ionic capital at the top, giving them a special architectural expression, though they do not really constitute an order.

Among the large designs exhibited we find two for railway station fronts; one a "projet" by M. Paul Normand, the other the executed "Gare de Nice," by M. Bobin. The former is an immense elevation, with plan, of a great central terminus, entirely in iron, the main feature being the great window, which forms a four-centred pointed arch, and evidently follows the line of the station roof; its effect is rather weakened by the vertical uprights which cut across it. The station buildings form a block on each side, but are entirely crushed by the iron front, the scale

of which is totally different, and the buildings seem to belong to some other construction. We find in another sense the same want of consistency of scale in M. Bobin's much smaller station. This is a masonry front, with a lofty centre marking the width of the railway, while the side portions extend beyond this and mask the rest of the station. The centre portion shows a lofty arch buttressed by large rusticated angle-blocks, over which are large ball finials which at once reduce the scale; and in the frieze is a colossal key-fret pattern, which assists towards the confusion of scale between the centre and side portions. This indifference to scale in details seems to us to be a frequent weakness in modern French architectural design. Otherwise, there are good points about this design, which is superior to much railway architecture that one sees.

M. Camut shows the drawings of his restoration and enlargement of the baths establishment at Mont Dore. The iron staircase details would never be admired in this country (except by engineers), but the coloured elevation of a portion of the wall of the grand saloon is a fine piece of classic treatment. The drawings include a restored plan and some details of the ancient Roman baths on the site. M. Gelbert exhibits six pen-and-ink views of the new church at Lourdes, of which M. Hardy is the architect. One of these has been reproduced in our pages, when we described the nature and object of the building. The view of the interior shows a domed church in solid masonry, of rather low proportions, and treated in what may be called a Neo-Byzantine manner. The drawings are comparatively small, and may attract little notice among the large sheets by which they are surrounded, but the design is one of the best pieces of modern architecture exhibited. No plan is given; a very unusual omission in a French set of architectural drawings.

Another very good design is that by M. Pillette for a proposed hôtel for the "Association des Architectes Diplômés par le Gouvernement." This is a very refined classic elevation; a rusticated basement story, an Ionic order above, with large windows marking the grand saloon (which extends the whole width of the front), and a well-designed attic, only that the vases which act as finials are too large. The section, showing the decorative treatment of the principal rooms, is beautifully worked out and in excellent taste throughout; the whole design being worthy of an architects' meeting-room.

Among prominent designs which represent the less admirable tendencies of modern French architecture are such things as M. Rives' Belvedere Hotel at Bellevue, a kind of mixture of railway-station and rustic park architecture, with round open-timber pavilions, developing enormous roofs like extinguishers. M. Léon Carle shows the elevation and longitudinal section and other drawings of his "Olympia" Theatre, which seems rather to be what we should call a "music-hall," and is certainly gew-gaw enough in its street front and interior decoration for that style of building; the plan, on a very confined site, is cleverly managed. M. Tronchet's "Projet de Bourse Maritime Commerciale," with a light-house tower and flagstaff appended, shows some power in the treatment of the flank elevation, but with a florid exuberance of detail which goes far to spoil it. A characteristic piece of executed shop architecture, "Le Dome Clignancourt," by M. Rives, shows that he can do something better than his Belvedere Hotel. This is a powerful treatment of a large and important business front, with a large central arch and sculptured pendiment over, flanked on each side by one of those slightly tapering "pylons" which the French are so fond of; in the lower part of these are arched niches with sculpture, and a boldly-projected balcony over; it is the detail of this part of the work which the large drawing exhibits, the niche being filled with a group by M. Falguière; a plaster model of the same portion of the building is also exhibited. This is a piece of work with a great deal of "go" in it; the defect is the one we so frequently find in French street architecture of this class, the want of restraint and refinement in detail. Here the rusticated jointing is on such a large and coarse scale that it seems completely to kill the sculptured group which is the centre of the whole; in the model more so than in the drawing.

The exhibition includes two examples of monumental designs, one of which, by M. Naudin, is of some importance. This is a design for the decoration of the Place Dauphine with a colossal statue of Justice on an architectural pedestal in the centre of the Place, flanked by an architectural screen on each side, consisting of a colonnade divided into sections by pylons at every third intercolumination, and terminated by a larger pylon at each end; the screens forming segments of a circle of which the statue is the centre. In front of each section of the colonnade is to be a seated statue of an eminent philosopher, orator, or legislator. Duc's Palais de Justice forms the background of the whole, the idea of which of course has relation to the proximity of this building. "Justice," in the drawing, looks rather like a colossal cook; but the architectural portion is well carried out, and might have a fine effect, though it would seem a little too isolated as an erection. We do not suppose, however, that there is the slightest chance of that or anything else of the kind being carried out there. The other design referred to is the drawing by M. Despradelle for a monument "Aux Gloires Françaises," to be erected in the Panthéon. This is a kind of stele on a pyramidal base, with a shallow niche on each side filled up with cartouches inscribed each with a name —"Kleber," "Carnot," &c. The effect of this is not good in a decorative sense; it looks rather like a box of lozenges. At the upper part of this stele a gilded angel seems hung on, flying out from the monument and blowing a trumpet. The whole is crowned by another gilded angel on a flying steed; and the base decorated with bas-reliefs. On the whole, we think the Panthéon will be better without it. As a contrast to this we may draw attention to the admirable design for the monument to Théodore de Banville, by M. Courtois-Suffit (the bust by M. Roulleau). This is a marble stele with a large Ionic capital, the centre of which is hidden by the name-tablet; over this is a section of cornice forming a pedestal to the bust. The front of the stele is decorated by a bronze lyre and foliage, not stiffly designed, but very freely treated and looking as if hung on to the front. Full-size details of the architectural portion are given. The whole is in admirable taste, and a model work of its kind.

In domestic architecture one finds sometimes a very careful setting out of very trite things, as in M. Lethorel's "Maison de Campagne à Ville d'Avray," a most carefully-executed frame of drawings—perspectives in the centre, plans and details all round—of a house absolutely without architectural interest. M. Paul Normand's "Villa à Montmorency," is a country house with a fine and unusual plan, the exterior effect of which is spoiled and vulgarised by the abnormal high roof and spike over the central feature. That is the kind of thing we complain of in the modern French country house; the architect cannot be content with repose of design, there must always be this outbreak of spiky roofs to give (we suppose) the picturesqueness supposed to be suitable to a rural site. In reality, nothing can be more at variance with the spirit of natural landscape. We used to sin in this way in England, in country houses, very much; but that sort of architectural vice is on the decline with us; it seems to be still rampant in France. As a contrast, there is a small set of drawings by M. Escalier of additions to what is evidently an old villa at Charny, probably early in this century. This is a very simple unpretending brick building, with a remarkable plan; a large oval-shaped entrance hall (the larger axis parallel to the front wall), with symmetrical stairs on each side winding up to the level of the inner vestibule and staircase, the sitting-rooms being arranged symmetrically on each side and in the rear of the staircase. The additional building, containing new kitchen, bath-room, bedrooms, &c., has been added as a block separate from the original house, with which it is connected by a two-storied arched bridge in a very effective manner. The author shows small oil sketches for the decorative paintings of the billiard-room, which are light and clever, though not in a true decorative style.

Decorative design, in fact, does not seem to flourish much. M. Hista gives a perspective interior of his Oriental decoration in a private house in Paris; this is good, though spoiled by the row of hideous masks below the cornice line. M. Lafollye's "Salle des Fêtes" for the celebration of civil marriages is shown in two large coloured elevations, giving the two ends of the room. These are worth attention; some details of the design are rather eccentric, but the colour effect of the whole is very good, and has really a festal appearance: the worst point in it is the design of the organ-case, which is very weak. M. Ehrmann's design for tapestry—subject, "Prometheus"—shows a circular picture in the centre, the chaining down of Prometheus; the remainder of the space being covered with delicately-designed conventional scroll-work, very good in itself, but not the thing for tapestry, which demands a broader treatment, less dependent on symmetry of line.

Among the drawings which are representations of old work only, there is a fine set of large coloured drawings by the MM. Saint-Père (father and son) of the tomb of "Philippe le Hardi," Duke of Burgundy: a full-size detail elevation is given, showing the heavy black marble base and top, with the carved figures and miniature arcade on the side of the tomb; a full-size section; and a very carefully-elaborated perspective view. It would be interesting to know with what object French architects produce these large drawings of ancient work; there is no statement of this being done for any official commission; is it for study purely, or is it for a place on the walls of the Salon? M. Nodet's "Vieilles Maisons de Tours" are drawings made for the Commission des Monuments Historiques, and most charming pieces of work they are. These are very carefully coloured elevations (mostly) of old buildings, so realistically executed that the very texture of the stones is shown. One of them shows the "Hôtel de Beaune Semblancy," with some of its curious details, including a frieze formed of knotted and festooned rope combined with wings, which must have had some symbolic meaning. Another shows a bit of an old house with one or two mullioned windows inserted in masonry formed of an irregular checquer of white stone blocks and red brick: another is a set of drawings of a remarkable brick circular staircase in the Rue Briçonnet, Tours, with a perspective view in which every brick and tile can be studied. The thoroughness with which French architects carry out this kind of pictorial record of old buildings for official purposes cannot be too highly praised. M. Yperman shows some interesting coloured drawings of old decorative work at Véretz (Indre-et-Loire), especially one of a half-obliterated but evidently very finely designed fresco of angels with musical instruments, from the chapel of the château of Clos-Luce. M. Goemans' water-colour sketches of Arab architecture are freely handled and effective; M. Schmidt sends a good frame of "croquis de voyage," more carefully if a little hardly executed. The pen drawings of this class are not much to speak of, and some of them would hardly get a place on the walls at Burlington House.

Of the drawings in the gallery round the central hall, a large number consist of a kind

of work that one sees every year with little variety; large classic designs for banks, Bourses, and other such buildings; still larger ones for casinos, which seem to be the occasion for the French architectural imagination to run its wildest riots on the largest surfaces of paper. Competition drawings for the "Hôpital Boucicaut" are numerous; one is hung in one of the rooms, and is, we presume, considered superior to those which are relegated to the gallery; to our thinking the design by M. Héneux, in the gallery, is the best plan and the most suitable architectural treatment for a large hospital of this class. M. Petit's "Consular Palace at Algiers" is a good Classic front, and the sheet of details a fine piece of pen-drawing. M. Mignan's Hôtel in the Rue de Varenne is shown in a very large set of drawings, including geometrical coloured drawings of interior decoration of rooms, which to English eyes seem rather cold and uninteresting: the exterior treatment of the house, though plain, is refined and pleasing. M. Mouclos shows an immense number of drawings of an absolutely commonplace villa. M. Cravio's "Villa au Bord de Mer," a stone house in the Italian style, is much better, though not worth all the space it occupies: the external frieze, apparently sgraffito, with figures and scrollwork white on a buff ground, is very pleasing, and gives a certain special character to the design. An American, Mr. Howard (pupil of M. Laloux) exhibits some sketches which are clever, but with a characteristic American assumption of a right to be as untidy and scribbly in drawing as he chooses. M. Freynet's "Habitation d'un Architecte" does not say much for the architect's taste in regard to detail. M. Chaussepied's drawings of the Chapel of Nôtre-Dame-du-Murier, at Batz, are a really valuable set of careful coloured drawings of a very interesting relic of Mediæval architecture; the nave arcade, with its richly-moulded arches dying into the surface of the circular piers, with no capital or impost, is very characteristic. M. Delmas' "Hôtels de MM. C—— et P——" shows in one drawing a very good and powerful treatment of an angle house, in a severe Classic style, with a strong cornice and a very plain attic over it; the balconies are rather heavy in design, but the whole is a good example of a street house of the larger class. Of the theatre and casino "projets" in the gallery we need say nothing; they cover so much wall space, and that is all; but we may call attention to some fine water-colour sketches (in the end gallery) of a very characteristic château, the "Manoir de Landifer," by M. Boutier. The plan is merely a long rectangle with a round tower at each angle; the effect of the building in the sketches is, however, remarkably picturesque. A curious feature in it is the number of small oval openings with which the walls are pierced, at irregular intervals, mostly just above the plinth and the upper string-course. Was this a simple Mediæval expedient for getting rid of slops of all kinds? It is a regular feature in this old château, with an obvious intention of some kind.

Whether the Champ de Mars Salon shows anything of higher architectural interest than the collection at the Palais de l'Industrie we must take another occasion to enquire.

LECTURES AT CARPENTERS' HALL. — The Carpenters' Company announces a series of lectures to be given at Carpenters' Hall on Wednesday evenings (commencing Wednesday, May 10) on carpentry and joinery. The list of lecturers includes Prof. Banister Fletcher, Mr. Thomas Blashill, Mr. Keith D. Young, and Prof. T. Roger Smith. The lectures will be given with a view to future examinations, and candidates' tickets and particulars may be obtained at Carpenters' Hall.

THE ENGLISH IRON TRADE.—With the exception of steel, business in all branches of the English iron trade remains unaltered. Pig-iron is quiet, and in manufactured iron little is doing. Tinplates continue to manifest fair activity. A brisker tone is noticeable in steel. Shipbuilding and engineering are still in a languid condition. The coal trade is slack.—*Iron.*

NOTES.

THE case of Gale *v.* Hervey, which came before a Divisional Court of the Queen's Bench Division this week on appeal from a County Court, again showed the necessity for buyers or tenants of houses to have the drainage carefully examined before they enter into a contract. The tenant in this case, as in many others, found the drainage was bad after the tenancy had begun. But there was no warranty in the contract as to the state of the drainage, and the most which could be proved was that the house-owner had said it was "all right." The County Court Judge found that it was all wrong, but he also found that there was no fraud on the part of the house-owner, and, under these circumstances, the Divisional Court pronounced in favour of the house-owner. There are, indeed, scores of house-owners whose knowledge of sanitary matters is so imperfect that they would say that drainage was all right, honestly believing it to be so, when it would be condemned by an expert at the very first glance. We can only repeat that if tenants wish to protect themselves they should call in the aid of an expert. This is not an expensive business when the house is a small one. Any competent builder in these days knows what are the main sanitary requirements. If the house is a large and important one, a person of higher class should be employed. Discomfort, illness, expense, and litigation would over and over again be saved if people in these matters would show but a little prudence and foresight. If the sanitary arrangements of the house which was the subject of litigation in Gale *v.* Hervey had been inspected before the contract was made, the plaintiff would have been fully protected, and she would not be the victim of an unsuccessful law-suit.

WE hope there will be a good attendance at the Institute of Architects on Monday to hear Professor Baldwin Brown's paper on "The Study of Vitruvius." The subject is one of great interest, and the meeting may be certain to hear from Professor Brown a thoughtful and well-considered paper.

NOW that the competition for the new Christ's Hospital Schools is fairly started, we may point out how important it is that these large schools should be models not only in regard to planning and architecture, but in regard to sanitary conditions. And in order the better to ensure this, it is desirable that there should be a medical expert added to the committee, and if possible one who has had some special experience in regard to the causes of outbreaks of illness in schools, and can make special suggestions as to dangers to be guarded against.

DR. FLINDERS PETRIE gave a lecture on Tuesday evening last at the Society of Arts, upon the "Primitive Art of Egypt." It need hardly be added that all Dr. Petrie's utterances upon Egyptian subjects are listened to with interest and profit. But the lecture in question was of unusual interest, from the fact that it treated of a subject of which little is known, and that little is mainly derived from his own recent discoveries. To ordinary observers, the style of the Egyptian monuments appears to be very much the same, through all the long period of the history of that remarkable country. Analogy with the art-work of other countries, where constant change, if not progress, is observed, is sufficient to dispel the belief, but Dr. Petrie has now demonstrated the differences between early Egyptian work and that of later date. Unlike the work of other nations, however, the earliest known work is shown to be among the best, the sculpture being altogether free from the mannerism which is all too conspicuous in the later works—in which, in fact, it becomes more apparent as the works become later. Dr. Petrie illustrated his lecture by an admirable series of photographs of the earliest sculptures known, all of which showed portraits of the persons represented. The features being so forcible and so marked, no other conclusion could reasonably be come to. But these works date from the pre-historic Fourth Dynasty! The technical excellence of the works is remarkable, showing that great perfection had already been arrived at in the use of tools at this remote period. Dr. Petrie has found hardly anything of earlier date than the Dynasty named, and he acknowledged that all his researches to find the origin of these works at a still earlier time had not yet produced results. Very many years of work must have passed away before such perfection could have been arrived at. Views were shown of the two most ancient temples yet discovered, those at Gizeh and at Gorub. In both the stones are cut with admirable precision, and laid in courses of large size, the material in the first instance being polished granite. The chair was taken by Mr. Poynter, R.A., who, on introducing the lecturer, spoke of what the latter had already accomplished with the Egyptian Government for the preservation of the ancient remains of the country. In the discussion which followed, Mr. Thorneycroft, Mr. Phené Spiers, and others took part.

A CORRESPONDENT of an evening contemporary recently called attention to the bad ventilation of the places of worship in London. It may fairly be said that this is a just complaint, but it should not be confined to churches only. The Courts at the Old Bailey—and, in fact, all the Courts of the metropolis—are defective in some way in regard to ventilation. The truth is that buildings which are not constantly used by the same persons in large numbers or of some importance, are not likely to be as well looked after as they should be. A juryman grumbles at the draughts or at the want of air, but he is only a single individual, and there is no collective action to remedy a defect. Again, persons attend church but once a week, as a rule, and consequently put up with want of air in summer in a way they would not do if they were at church every day of their lives. The difficulty in the way of improvement of any kind in these days is the want of collective force and influence. When this can be found, improvements are possible.

A BEGINNING has been made for the building, after the designs of Mr. Taylor, Architect to the Office of Works, of the second block for the new Patent Office (extension). The ground has been cleared between Took's-court and the east end of Quality-court, Chancery-lane. The greater part of the area has been open ground for a long period. It is so shown in Ogilby and Morgan's map, 300 ft. to 1 in. scale, 1677, and in some large scale maps of this and the preceding centuries. Beneath the gardens of the two houses in Took's-court, to which we referred on March 19 of last year as then occupied by Mr. J. C. Francis for the *Athenæum* and *Notes and Queries* offices, some large cellars and remains of thick walls, all built of red brick, have been dug up, at from 2 ft. to 3 ft. below the surface, together with a small room, lighted by a window of which the glazing had remained, and the lower portion of a round kiln-shaped structure. One cellar is divided into nine compartments, perhaps for wine-bins or safes, the dividing masonry being constructed of bricks and large red tiles.

AMONGST the many Scottish properties which have been placed in the market for sale this season is the Balthayock estate,

covering nearly 1,500 acres, and offered at an upset price of 40,000*l.* It lies near to Kinnoull, in Perthshire, and close to the Carse of Gowrie. Not far from the house stands a "keep," which is traditionally the remains of a Templars' castle. It is situated above a deep ravine. and commands a fine prospect over the Tay valley. The castle was the seat of the Blairs of Balthayock in the time of William the Lion, and for long afterwards. In the "Castellated and Domestic Architecture of Scotland," by Messrs. MacGibbon and Ross (1889), the tower is assigned to the period 1300-1400. It is described by them as being a massive simple keep of the usual description, measuring 52 ft. by 37 ft., and having very thick walls. They go on to say:—

"It is still of considerable height, but has lost its battlements, and is furnished with a modern roof. The interior is also modernised, but shows the usual dispositions, the hall being on the first floor, with entrance door at that level, and turnpike stair in an angle to the upper floors."

The whole place, they add, is kept in fine order.

THE Beiblatt to the last number of the *Jahrbuch* of the Archæological Institute at Berlin contains an interesting paper on the recent investigations respecting the Pantheon. The writer, Dr. O. Richter, expressly stated that his views must be regarded as professional, and that he himself waits the completion of the excavations before he can express absolute conviction. His views in summary are:—1. Agrippa built the Pantheon B.C. 27; it was then a circular building of the same dimensions as at present, covered with a tent-roof. This building suffered from fire twice, in A.D. 80 and A.D. 110; the last fire rendered a new building necessary. 2. Hadrian completed the new Pantheon, that standing now, in A.D. 125. He used some of the old material, and raised the level of the temple more than 2 in. The statutes of Augustus and Agrippa, and the inscription naming "Agrippa" as the founder, were reset up. 3. At some time that cannot be definitely fixed, between the date of Hadrian and Severus, the portico in front of the building that still stands there was built. At the same time the pediment groups and the Agrippa inscription were placed in, and below the pediment of the portico. 4. In 402 A.D. Septimius Severus carried out a complete internal restoration of Hadrian's structure.

THE ruins of the old Roman north gate at Cologne, which are in close proximity to the Cathedral, have lately been the subject of much discussion in the Common Council of that city, the councillors having to decide whether the interesting archæological remains were to be further preserved, or covered up so as to facilitate vehicular traffic on the new Dom Platz. According to an article by Bau-inspector Schulze, in the *Cologne Gazette*, the gate, which was formerly known as the Porta Papia, had a frontage of 103 ft. and a depth of 39 ft.—dimensions nearly as large as those of the well-known Porta Nigra at Trêves. The gate, which is known to have stood until as late as 1826, showed the usual plan, *i.e.*, the combination of a main entrance with two narrow side entrances, all three provided with double gates, and the main entrance also with a portcullis. The existence of an upper story of architectural pretensions has been proved, and, according to a reconstruction illustrated in the *Centralblatt der Bauverwaltung*, showed the Corinthian Order in its simplest form. The flanking towers to the gateway are not shown higher than the ramparts, and hence resemble those at Aosta and Pompeii. The height of the old ramparts is estimated at 30 ft.

THE *Transactions* of the American Society of Civil Engineers for February, in giving an account of the restoration of the cable ends of the Covington and Cincinnati suspension bridge, built in the years 1856 to 1867 by John Roebling, and which contained the longest span of any bridge in existence until its central span of 1,057 ft. was exceeded in the New York and Brooklyn bridge built in 1870-83 by the same engineer, states that Roebling's faith in the preservative quality of cement mortar had led him to bury the anchor chains and cable ends of the former bridge in masonry, but that subsequent deterioration in the cable ends necessitated further precautionary measures. It is a well known fact that unless rusty iron is thoroughly cleaned before painting, it will continue to rust under the paint, which, in such cases, is only a delusive means of security. Hence, rather than trust to making the chamber containing the anchorage accessible for inspection and repainting periodically, the plan was tried of entirely excluding air and moisture by a permanent oil bath. Paraffin oil was selected, on account of its neutral qualities, coupled with its great fluidity, which allows it to penetrate all interstices between the wires. But when it was found that the oil appeared through the joints of the masonry some distance back and below the tank, it was decided to draw the oil out and replace it with paraffin wax, melted in a steam kettle, which has given a satisfactory result. The cheaper grade or crude wax, which contains a large proportion of oil, was used, melting at 116 deg. Fahr. It was noticeable at the inspection that the greatest deterioration of wire occurred where a piece of wood or stone was in contact with the rope, while a further examination of the cable by the aid of wooden wedges to open the strands, revealed the fact that the inside wires were in comparatively good condition. The same publication, in reporting a discussion upon road construction, maintains the superiority of a 15 or 20 ton steam-roller over the efficiency of a 5 ton horse-roller, and argues as to the action of narrow tyres in destroying the surface of a road, urging that the tyres of traffic vehicles should be constructed so as to prove preservers instead of destroyers of highways. Binding material of a sharp and gritty character, preferably screenings from the stone used for the road, is introduced, not to interfere with the stones coming together, but to fill up interstices, and the object of rolling should be, not to force the lower course down, but to compact the upper layers. The less that binding material is found necessary, the cleaner and more durable will be the roadway.

THE *Journal of the Franklin Institute* for April contains a description of the 100-ton Sellers' travelling crane, erected at the Baldwin Locomotive Works, Philadelphia, where it is operated by electricity over a span of 74 ft. 8 in., with a run of 335 ft., and is capable of transporting with ease either a complete locomotive or a delicate sand-mould without disturbing a grain of sand. The bridge travels at a rate of either 100 ft. or 200 ft. per minute, as desired; the trolley travels crossways 50 ft. or 100 ft. per minute; while the hoisting and lowering apparatus is capable of moving at from 5 to 50 ft. per minute. The author shows the advantages of an over-head traveller occupying no floor space, compared with fixed jib-cranes limited in radius; and he points out that the limit of capacity of any establishment for large orders is determined by its facilities for handling its plant and material with economy and despatch. In extensive shops we think, however, that fixed cranes cannot be entirely dispensed with. A traveller, though indispensable, can only be in one position at a time. Another useful paper in the same journal is that entitled "Causes of Fire," in which the author, while admitting it is a difficult matter to discover their origin, truly remarks that what we frequently call an accident is very often due to our imperfect knowledge of natural laws. The author considers the public to be even more ignorant in these vitally important matters than in hygiene. Inspections are entrusted to unreliable persons because they offer cheap terms, and he urges the co-operation of the Press in instructing the public, as prevention is better than cure.

PEOPLE with antiquarian tastes who may be content with assertion instead of fact—and there may be some such—will be interested in the "discovery" which a writer in the *Pall Mall Budget* has just made. In the classic region of the Waterloo-road, Lambeth, he has discovered the site of an ancient nunnery, of which truly there is no record at all! Its gardens stretched down to the Thames; there is a "nun's" walk beneath the roadway, a Roman arch, Norman and thirteenth-century work, and, of course, a cell with a length of chain, the latter being of a peculiar description. The occupier has seen old prints that show the buildings so long ago as before the existence of Vauxhall Gardens (!), and the premises are crowded by antiquaries eager to inspect the ancient remains. The letterpress is accompanied by some fairly good sketches, which indicate some of the features which are more especially referred to. Two of these objects, at any rate, are ancient and of interest. The first is a chimney-piece described as being six centuries old, but having a frieze which is said to date from the "eleventh century," with blue and white tiles of the same early date. It proves to be a very good piece of work of the middle of the sixteenth century, having a decided semblance feeling in its sculptured ornament. Frieze and jambs are of the same age, the latter repaired, but the tiles are of modern date, with printed patterns, and the mantel is no older. There is a large bold stone arch in the basement, with circles in the spandrels of early fifteenth century workmanship, leading to the "Nun's walk," and close to the door of the "cell," all the latter being in modern brickwork. But what is the true history of this blending of really ancient work with such a setting of recent years? The solution is very easy and simple. The house in question, at the corner of Anne-street, now occupied in part by printing works, was formerly the residence of Mr. Cottingham, the well-known architect. Here the Cottingham Museum, that curious assemblage of ancient fragments and modern casts, was collected, and here it existed to the period of its dispersal by auction only about forty years ago. In the period when Cottingham flourished, an architect in fair practice had abundant opportunities of collecting fragments of ancient buildings from the works he might have in progress, or by gifts from his clients, too careless or too indifferent to have any such replaced in the reparations. Hence the Cottingham Museum contained objects that should never have been in it, of which the fireplace and the arch in the basement are examples. Since they are fixtures, they were not included in the sale. The entrance doorway of the house, in the "Norman style," of which our contemporary gives a sketch, is too slight to be of ancient work, but above it is a pretty shield supported by angels, and charged with the arms of England and Old France quarterly, which may be ancient. There was formerly a canopy of stone to this dooway, which was removed a few years ago. All this is such modern history that it is not a little surprising that the hand which can draw well should write with so little care. Reference to any history of Lambeth is not difficult, even if the lists of monastic buildings are not readily obtainable, and the public may reasonably expect that a writer should at least take the small pains of easy reference, which would at once refute haphazard statements.

A CORRESPONDENT has sent us an advertisement, apparently from a Norfolk paper,* headed "Great Yarmouth

* We may take this opportunity of observing that cuttings from newspapers, whether intended to convey information or to be the subject of comment, should always be accompanied by the name and date of the paper from which they are taken.

Union: to Architects," and proceeding to state that tenders are invited from architects desirous of preparing plans and specifications and superintending the new works for additions to the workhouse of the Union, and that the person appointed as architect will not be allowed to charge any fees or commission in addition to the amount stated in the tender. From this it would seem that the Great Yarmouth Union does not understand the difference between an architect and a contractor, and that they are going to give the job to the architect who will work cheapest. A proposal like this implies not only an insult to the architectural profession, but a failure of duty on the part of the Union, who are certainly bound to see public works carried out in the best manner, in regard to construction and sanitation; an end which is not to be attained by advertising for the cheapest architect.

ARCHITECTURE AT THE ROYAL ACADEMY.—II.

HAVING noticed some of the most prominent works in the Architectural Room, we will refer to some others *seriatim* and in the order of hanging.

1,479: "A Doctor's House in the Country": Mr. E. Beckitt Lamb. Why "A Doctor's House?" There is nothing specially doctorial in the architectural expression of the house, as far as we can see. It is a pretty rural house, with three gables or bays in a row, with windows above and below and white plastered panels between them: the mass of tiled roof rather over-weights the building. The drawing shows a clever treatment in colouring, to which perhaps it partly owes its position. A small plan is appended.

1,480: "Additions to 'Roxley'": Messrs. Wimperis & Arber. There is no plan, and nothing in the drawing to show which are the additions and which is the original part of the house; criticism is therefore impossible. The drawing, a pen-line one, shows a picturesque-looking L-shaped house with timber gables.

1,481: "Proposed House, based on Bramhall Hall": Mr. R. A. Briggs. This is an interesting experiment at reviving an ancient and very picturesque type of English house. In the plan as given here the hall seems rather too much cut up into recesses, and moreover the position of it is not quite expressed in the exterior design. We may observe however, in regard to any attempt to revive this type of house, with its large extent of timber and plaster work, that if this exterior finish is only added on the front of a brick wall it is rather a pretence; while, on the other hand, if it is fully carried out as what it appears to be, it makes a very cold house in winter.

1,483: "Woodcroft, Leek": Mr. Larner Sugden. This drawing was published in the *Builder* of December 12, 1891. The grouping of the house is effective, but the plan seems rather like a studied aim at picturesque irregularity, in which practical convenience is to some extent sacrificed, as in the crooked in-and-out plan of the billiard room, certainly not the best shape of room for the purpose; and even on artistic grounds a billiard-room should be regular and rectangular in plan, to coincide with the necessarily rectangular lines of the billiard-table which is its *raison d'être*, and which fills up such a large part of the room.

1,484: "194, Queen's-gate, South Kensington": Mr. R. A. Briggs. A good specimen of a street house in brick, treated simply but with massive and substantial detail. The carved in-and-out lines of the bay and balcony on the second floor, however, though they serve to break the flat elevation, look as if more support was required underneath. The small panes and thick sash-bars are exaggerated (we hope) in the drawing, for effect; if they are executed as shown here, it is not a desirable make of window for a town where light is not too clear and abundant. No plan is given.

1,486: "New Chapel, The Cancer Hospital": Mr. A. Graham. A sepia drawing showing the chapel projected from the main building, as an obvious addition and with no attempt to combine it architecturally; it stands out as the chapel, separate from the hospital architecture. It is treated in a simple Gothic style. No plan.

1,487: "Sketch for Stained Glass Window": Mr. W. Aikman. Three lights with square heads filled with a design showing the Marriage at Cana. It is powerful in colour and somewhat unusual in general effect and treatment: it escapes the "church furniture" style of glass design which is too prevalent at present, and looks like the work of an independent artist.

1,488: "Design for St. Andrew's Church, Ayr": Messrs. Morris & Hunter. A cleverly executed tinted drawing of a church of Gothic style and with some special character in the treatment of detail. The carrying up of the spire lines quite plain till near the top, where the angles break out into crockets, is a pretty idea, and the whole design hangs together well. No plan is given.

1,489: "Extension of Church, West Dulwich": Mr. E. T. Hall. How much is "extension"? we presume it is the piece patched on in the foreground; there is no plan to show. The drawing is an effective one.

1,490: "New Church, Staines; interior looking east": Mr. G. H. Fellowes Prynne. The principal object of this drawing evidently is to show the form of built-up chancel screen to which its architect has directed special attention lately. Here the chancel arch is entirely occupied by a stone screen, forming an architectural filling to the opening. The lower portion consists of three lofty foliated arches or "lights," the shafts dividing them rising from bases on each side of the gateway into the chancel. Above the three main arches, which spring from the impost level of the chancel arch, the space is divided up by mullions into smaller openings in which figures are placed, standing free of the tracery. The effect of the whole is to produce a degree of monumental appearance and architectural unity which is not obtained, it must be admitted, by the introduction of a wood or metal screen which has no direct connexion with the structure of the building.

1,491: "St. John's Church, High Leigh, Cheshire": Mr. E. Kirby. This is a half-timber treatment of a country church, a kind of "chalet" church; not, we think, quite sufficiently ecclesiastical in character. It shows a narthex across the end with a high hut-like roof, and a kind of bay window over it, and a bell-turret over that, all in timber work and somewhat too irregularly piled one on another. We cannot help thinking that it looks more like the back of a pavilion for a cricket-field or racecourse, where a special attempt at the picturesque had been made, than like a church: but this may be prejudice.

1492: "New Church, Mission-house, and Schools for Italian Protestants, Clerkenwell": Mr. Alfred H. Tillman. A small pen drawing of a church with a detached campanile and a sloped cornice to the gable after the manner of Italian Gothic. It looks satisfactory and suitable for the purpose.

1,493: "North End of Bath Room, in Tiles, Mosaic, and Faïence": Mr. C. Temple. This is, we believe, really the design for a portion of the Chicago exhibit of Messrs. Maw & Co. It is a very pretty piece of work of its kind. There is a marble surbase supported by marble pilasters, between which the space is filled with conventional water-plants, in mosaic on a gold ground, and a grey conventional representation of water at the base; above the surbase are tiled walls divided into panels, which are occupied by figures and scroll-ornament of Renaissance type; a frieze of similar ornament drops down pendants which fill up the space between the panel-borders.

1,494: "House at Lismore": Mr. F. L. Pearson. A quiet country house with partially tiled walls and presenting no special feature to call for remark, which perhaps was the object of the designer. A small plan is added.

1,495: "Church, House, and Schools, Bexhill-on-Sea": Mr. Philip H. Tree. This is a very clever small pen-and-ink sketch, showing a picturesque design; in the treatment of the large window, with buttresses introduced at the principal mullions to give it support, the architect is rather palpably imitating a feature which has been seen in drawings by other architects, or by one other, in previous exhibitions. The upper and lower portions of the tower seem rather to want connexion, which might have been gained by carrying the lower buttresses up farther and working them into the upper portion. But as a whole this is a very good little drawing.

1,497: "New Entrance-lodge and Gateway, Welbeck Abbey": Mr. John Brooke. This is a good gateway design: it shows a curved fence-line on each side meeting at the central gate piers, which are happily treated as blocks of masonry worked into the form of a Roman Doric order, showing two columns on the face of each pier, and leaving a long pedestal or blocking over the cornice as the support for a heraldic animal placed sideways and facing towards the main gate. The design of the piers is carefully worked out, and the ironwork of the gates and fence railings is well designed. The side entrances are formed through arches in the lower portion of the stone piers.

1,500: "Holy Women of the Old Testament; Part of a Frieze": Mr. N. H. J. Westlake. This represents a row of draped figures executed in pencil, and a continuation of the same design of which another portion was shown in a drawing in last year's Academy, and illustrated in the *Builder* for September 3, 1892.

1,501: "Design for the Church of St. Peter, Abbeydale, Sheffield": Mr. Sydney Vacher. This is one of the designs sent in for what appears to have been a rather important church competition. The drawing, which is a pen-line one, rather hard and mechanical in style, shows an interior with a wooden-panelled roof in cants, and four-centred arches to the nave; the exterior view shows the east end with gables with traceried windows placed high up and a considerable space of blank wall below them. The treatment of this portion has breadth and character; we do not quite like the oblique buttresses to the centre aisle, which is very slightly projected beyond the side one, so that the buttresses seem almost to start out of the wall and leave an awkward inner angle; and of course buttresses are not in the least called for constructively where the wall projects so little beyond the adjoining walls—a mere break in fact. A plan of the church is added.

1,502: "Edinscourt, Disley, Cheshire:" Mr. John Brooke. This is an unusual and characteristically treated front. The house has two similar gables, with a varied treatment of the architectural labels of the windows below them, one showing square lines, the other circular; the dining-room on plan shows a square-lined projecting bay at the left side of the façade, the drawing-room a circular one at the right-hand side; the general scheme of the house is symmetry in general lines with an appropriate variety in detail.

1,503: "New Entrance Gates and Lodge, Eaton Hall": Mr. R. W. Edis. A straight gate with large outer piers, and smaller ones on either side of the centre gate; the larger ones are treated in a French neo-Classic style, with a cornice and short thick angle balusters worked out of the upper part of the pier; the whole in good taste but a little wanting in distinction for entrance to so important an estate.

1,504: "Compton Leigh, Frognal Gardens, Hampstead:" Mr. James Neale. No plan; an effective pen drawing of a house partially tiled, and in which the principal feature is a large octagon angle-turret with wide-spreading eaves.

1,505: "Design for organ-front, St. Mary Abbott's, Kensington:" Mr. J. Oldrid Scott. An interior of the church, in which the organ front seems rather a subordinate feature on the south wall of the chancel; what strikes us is that very little of the organ is in front, most of it is evidently in the aisle on the other side of the wall, and consequently to those who know what space an organ requires the impression is that this must be a very small organ, placed flat against the wall, which is hardly satisfactory.

THE NEW GALLERY EXHIBITION.

EVERYBODY is saying that Mr. Sargent's portrait of Mrs. Hammersley (128) is *the* work to see in the New Gallery, and everybody is right. It is a most brilliant performance, in the management of the difficult scheme of colour, a bright rose-coloured dress and greyish stuffs and curtains; the figure itself is full of spirit and charm; even the masterly way in which the carpet pattern is indicated without being too much emphasised should be recognised. We only quarrel with the perspective, the effect of which, from the position at least in which the picture is now seen, is to suggest the idea of a yacht's cabin with the ship heeling a good deal and the floor consequently sloping. Other portraits are, an admirable one of "Sir John Lubbock" (4) by Mr. Collier, balanced by an excellent work of the same class by Mr. Parker (20), remarkably fine in colour; Mr. Hacker's fine and effective portrait of a little boy (39); Mr. Shannon's "Miss Kennedy" (37), painted for Newnham College, and Mr. Sargent's "Mrs. George Lewis" (177).

Two painters of genius, Mr. G. F. Watts and Mr. Crane, have essayed to put into pictorial shape the fancy of the breaking waves as "Neptune's Horses." We do not know whether the idea can be called a very happy one; it is a fancy which falls to pieces when one tries to make it into fact, and accordingly Mr. Watts has been the most successful, in that he has kept the horse forms as misty and undefined as he could, merely suggest-

ing them indistinctly; at a little distance the picture (78) only suggests breaking waves; the clever manner in which they are made out into horses without forcing the forms too much on the eye is the real point of the picture. Mr. Crane has defined his row of sea horses, with prancing fore-legs, far too clearly (216); the best point in the picture is the crest on one of the more distant waves, which takes indistinctly the form of horses' heads just seen above the water, and appearing to hurry along with the advancing wave. "A Masque of Spring Flowers" (199) by the same artist is a charming fancy, in a form better suited for pictorial representation.

Mr. Burne-Jones is not at his best this year in his two works, "The Pilgrim at the Gate of Idleness" and "The Heart of the Rose" (64, 66), they are not (for him) very striking in colour and design, and the meaning of the last-named one is not very clear. Mr. Waterhouse's "Naiad" (40), who gets up out of a brook to look at a youth asleep on the grass, is a striking picture in colour and conception, and the Naiad looks damp and watery enough, but a little too human for a legendary being; there is an unhappy suggestion about it of a bather whose clothes have been stolen. Mr. Strudwick's elaborate fancy of Love enthroned (19) is a fine decorative picture on a small scale; not more than that. Mr. Tadema's "Unconscious Rivals" (12) is one of the most interesting works of the year; the scene is a marble-railed gallery running across the impost level of a deeply-recessed arch in some Roman building, through which, as through a tunnel, we look out on the landscape, and two women lean against the railing; the decorated soffit of the arch is an admirable bit of architectural incident, which we have not before seen in painting. Mr. Watts's "The Open Door" (55) is an interesting work, a glimpse given into a stormy outside landscape through a door-way, which a woman opens for a moment to look out. Mr. Philip Burne-Jones has given a powerful illustration of that unhappy figure in the history of tyranny, "The Man in the Iron Mask" (103), which certainly gives a new reality to the story.

Of other figure pictures we may draw attention to a very fine half-length study by Mr. Jacomb-Hood (147) of a lady in a velvet dress, a splendid bit of colour; Mr. Nettleship's large picture of a fight between a tiger and a python (157), not as real as his tiger at the Academy; Mrs. Normand's pretty figure under the title "Pets"; Mr. Tuke's "Greek Lemon Gatherer" (247); and Mr. Gere's "Finding of the Infant St. George" (251), an illustration of Spenser in which the painter has caught something of the mingled mysticism and naïveté of the "Faërie Queene."

There are some fine landscapes; including a beautiful broadly painted sea-side scene, "Breezy Pastures" (174), by Mr. Adrian Stokes; a rich but rather artificial wooded landscape by Mr. North (181); a Hampshire scene by Mr. D. Murray (168), notable for its beautiful and tenderly painted sky; a fine coast scene at "Skipness" (69) by Mr. R. W. Allen; a study of an effect of "Silver Mist" (37) by Mr. F. Hall; a little twilight landscape, "The Track of the Strayed" (15), by Miss A. Alma-Tadema, which is very original; and a beautiful spring landscape by Mr. H. W. B. Davis (220). Among architectural subjects Mr. Logsdail sends two pictures of bits of Venice (143, 190); Mr. Frank Dillon a view of the "Tomb of Theodoric at Ravenna" (224), and Mr. MacWhirter a view of Venice from the Sea (235).

Sculpture is not largely represented: the principal work is the vigorous life-size figure of "A Scytheman," by Mr. E. R. Mullins.

THE *CONVERSAZIONE* OF THE ROYAL SOCIETY.

THE *conversazione* held by the Royal Society in its apartments at Burlington House on Wednesday evening last was, as usual, well attended and full of interest.

As on previous occasions, a number of objects were exhibited, together with apparatus of various kinds illustrating recent advances in scientific knowledge. These were of a more representative character than they have been for the past two or three years, and it is noteworthy that the class known as "brilliant experiments" were fewer in number. This is decidedly a step in the right direction. The rooms could be filled with apparatus producing startling ocular results, but unless these were novel, and were of considerable scientific value, the fearful machines which produce them should be rigidly excluded from the purlieus of the Royal Society.

Exceedingly few of the exhibits were of direct interest to architects. We might, however, instance that of Prof. C. V. Boys, who showed a device for drawing curves by their curvature. It consists of a transparent celluloid scale divided into equal parts, reciprocally (or in any special manner); a glass pen or a pencil at its zero point (which is in the centre, the divisions being carried each way) describes the short arcs, and a flat tripod, with three needle feet, two on the paper, and one on the centre line of the rule, fixes the centre of curvature. This instrument draws certain curves more smoothly, rapidly, and accurately than is possible using the same care in the ordinary way. Mr. Cecil Carus-Wilson exhibited an apparatus called a Scotographoscope, for enabling lecturers to demonstrate with chalks in a darkened room. A lamp is placed inside a large box, the front of which is made of roughened glass with a sliding dark screen before it. On removing the screen the glass is seen to be illuminated, and diagrams can be drawn on its surface. The arrangement is an ingenious one, but we do not think it will be very extensively used. It is, of course, primarily intended to be used in conjunction with the lantern, for class lecture purposes. But it is impossible for students to make notes of what is shown or drawn in a dark room, and herein consists the disadvantage of this method of demonstration.

Messrs. W. Topley and R. Kerr exhibited maps and photographs illustrating the recent landslip at Sandgate. The maps showed the geology of the district and indicated the "slipped" areas; whilst the photos were views of the disturbed ground, and the damage done to houses and to groynes. Mr. E. T. Newton showed the remains of some remarkable fossil reptiles, discovered by him in the building sandstone of Cuttie's Hillock quarry, near Elgin; there were also several other exhibits in the domain of natural history.

The electrical exhibits claimed much attention, though there was nothing very novel. Tesla's experiments, and slight modifications thereof, have become the *répertoire* of nearly every popular lecturer on electricity, and there is no need to repeat them *ad nauseam*. There was a time, not long since, when people stood aghast at the bare idea of having powerful high-frequency currents of electricity passed through the body, and the experimenter was regarded in the light of a hero; but when it came to be generally known that such currents possessed but little physiological action, the illusion was dispelled. Many of those who saw Mr. A. A. Campbell Swinton's experiments on Wednesday evening, when the filament of an ordinary 5 c.p. 100-volt lamp was made incandescent with current conveyed through the human body, &c., &c., no doubt bore these facts in mind. Sir David Salomons showed one of a pair of tuning-forks, worked electrically, and made of platinoid and gun-metal; a portable photometer; and a table polariscope. In conjunction with Mr. L. Pyke, he also exhibited, amongst other things, a one-million frequency alternator, and a small inductor dynamo and motor, in which the efficiency of the alternator exceeds 90 per cent., and at a speed of 2,000 revolutions per minute, the output of the machine is $1\frac{1}{2}$ kilowatts. This great efficiency is ascribed to the close construction of the magnetic field, and to the fact that the whole of the metal subject to even the smallest variation of magnetic density is luminated. Major Holden had instruments for indicating and recording the electrical pressure and current on alternating systems of supply; a self-recording pyrometer, &c.

Messrs. Baly & Chorley exhibited sodium potassium high temperature thermometers (range 0 deg.—620 deg. C.) and specimens of the alloy; Mr. H. L. Callendar, platinum thermometers and pyrometers, and galvanometers; whilst Prof. A. Smithells made some striking experiments demonstrating the structure of flames.

During the evening Mr. E. Wethered showed, by means of the electric lantern, the remains of some micro-organisms found in certain limestones, the function of which in forming oolite building stones has been previously adverted to in our columns. Lord Armstrong, in the same manner, conducted some experiments to show the nature of the electric discharge in air and water. Professor H. Marshall Ward threw on the screen a series of photographs demonstrating the action of solar and electric light on the spores of bacteria and fungi. Among other things he conclusively proved that sunlight kills the spores of bacteria and fungi; and that the action depends on the intensity of the light, and the time of exposure. In some respects, this was the most interesting part of the *conversazione*, and it must have material bearing on certain questions relating to water storage and water-supply generally.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS:

THE ANNUAL REPORT.

THE annual general meeting of the Royal Institute of British Architects was held on Monday, May 1. The Annual Report of the Council, which was adopted, contained the following passages:—

The Council, elected on June 13, 1892, have held twenty-one meetings; and since the publication of the last annual report on May 5, 1892, twenty-four meetings. The Professional Practice Committee of Council, the Finance Committee of Council, the Alliance Committee of Council, the Royal Gold Medal Committee of Council have met as usual; and the Rota Committees, composed of sections of the Council, have met periodically for the consideration of candidates' applications for membership.

During the official year 40 Fellows, 16 of whom were previously members in the class of Associates, and 57 Associates, have been elected. Though these figures compare unfavourably with those of 1891-92, when 66 Fellows and 51 Associates were elected, the number of Fellows (in spite of severe losses by death) is now 623, as against 610, and the number of Associates 814, as against 794, at the corresponding period last year. One Hon. Associate, Mr. T. H. Wyatt (who had resigned in 1890), and one Hon. Corresponding Member, Professor Babcock (Cornell University, Ithaca, New York State), have also been elected. His Grace the Duke of Devonshire, K.G., has been elected an Hon. Fellow.

At the opening meeting of the current session, Mr. William Emerson, a Member of Council, was elected Hon. Secretary, Mr. Aston Webb having resigned.

The losses by death in the class of Fellows have been:—Henry George Austin (Canterbury), William Allen Boulnois, Richard Herbert Carpenter, John Myrie Cory (Shanghai), Joseph Stretch Crowther (Alderley Edge, Cheshire), John Garrard Elgood (Manchester), James Fowler (Louth), John Gibson, Philip Herepath (New Zealand), Richard Smith Lander, Joseph Peacock, Thomas Stone, Alfred Strong, Thomas Tillman (Sunderland), William Charles Tuke (Manchester), John Goldicutt Turner (Rickinghall, Diss), James Williams. In the class of Associates: George Canning Richardson (Llangollen, Wales). In the class of Hon. Associates: Matthew Wyatt (Winchfield, Hants). In the class of Hon. Corr. Members: George Snell (Boston, Mass.). In the class of Hon. Fellows: Walter Charles James, Lord Northbourne.

The Preliminary Examinations of November, 1892, and March, 1893, were held in London, Bristol, and Manchester, with the result that 169 gentlemen have been registered as Probationers. At the same time, Intermediate Examinations of 54 Probationers were held in London, with the result that 34 Probationers have been registered as Students. There are now 532 Probationers and 75 Students on the respective registers. The Examination qualifying for candidature as Associate was held in London only last autumn, and it has been held this spring in London, Glasgow, Bristol, Leeds, Manchester, and Newcastle. Statistics of these Examinations follow:—

The Preliminary Examination.

Dates.	Admitted.	Not passed.	Relegated for periods.	Passed and Registered as Probationers.
Nov., '92 ..	82 { 40 Exempted, 42 Examined }	2	5	75
March, '93 ..	110 { 51 Exempted, 59 Examined }	—	16	94
—	192	2	21	169

The Intermediate Examination.

Dates.	Probationers Admitted.	Not passed.	Relegated for periods.	Passed and Registered as Students.
Nov., 1892..	24	—	11	13
March, 1893	30	—	9	21
—	54	—	20	34

The Examination Qualifying for Candidature as Associate.

Dates.	Applied.	Admitted	Not passsed.	Relegated for periods.	Passed.
Dec., '92	50	36	—	24	12
April, '93	126	106*	—	58	42
—	176	142	—	82	54

* Six, out of the 106 applicants admitted, did not attend.

The Council desire to record their indebtedness to the officers and members of those Allied Societies under whose charge examinations have been conducted during the official year; and their obligation to the Chairman and members of the Board of Examiners in Architecture increases year by year. Except in the case of the Preliminary Examination, in which a professional examiner is now employed to set the questions and mark the answers in six out of the eight subjects, the work of the examiners is entirely honorary.

Without dwelling on the fact of the large increase in the number of applicants for admission to the several examinations, it may be interesting to note that during the past official year there were 192 admitted to the Preliminary Examination against 146 during the preceding year, and 142 admitted to the Examination qualifying for candidature as Associate, the number in 1891-92 having been 121.

The Ashpitel Prize was awarded to Mr. Alfred C. Houston (Associate), as having most highly distinguished himself among the sixty-one candidates who passed the qualifying examination in 1892. An additional prize (value five guineas) was awarded, on the recommendation of the Board of Examiners, to Mr. Harold Brakspear (Associate).

A Statutory Examination for Certificates of Competency to act as District Surveyor in London was held last October, when five gentlemen presented themselves, one of whom—Mr. Watson Hall—passed and received his certificate. Another examination was held at the end of April, when five gentlemen presented themselves, two of whom—Mr. Albert William Cleaver (Associate) and Mr. Reginald Molesworth Gruggen (Associate)—passed, and Certificates of Competency to act as District Surveyor in London have been granted to them.

The Institute of New South Wales, established at Sydney in the year 1871, and incorporated in 1890 under the Companies Act, has been admitted to alliance with the Royal Institute of British Architects.

The Royal Gold Medal (1892) for the promotion of architecture was presented to Monsieur César Daly, Hon. Corr. Member (Paris), for his literary works in connexion with architecture, and acknowledged by him in an eloquent speech delivered in English at a general meeting of the Institute, held June 27, 1892.* The award of the Royal Gold Medal for 1893, to Mr. Richard M. Hunt, Hon. Corr. Member (New York), for his executed works as an architect, recommended by a resolution of the Institute passed on March 13, 1893, has been approved by Her Majesty the Queen.

The works submitted this year for the Prizes and Studentships have been exceptionally numerous, and generally excellent in quality. The annual deed of award was presented to the General Meeting of January 9 last, and at the presentation of prizes on the 16th of the same month an Address to Students on "Some Responsibilities of the Architect" was delivered by the President, and a "Review of the Students' Works" by the Hon. Secretary, Mr. Wm. Emerson. The exhibition of the drawings included a selection from the "Testimonies of Study" sent in by Probationers applying to be admitted to the Intermediate Examination. . . . .

Not the least interesting event of the official year was the exhibition of the drawings of Palladio, Inigo Jones, Kent, and others, lent to the Institute by the Duke of Devonshire, and forming part of the famous collection made by the great Earl of Burlington. The portfolios containing the drawings of Palladio and others have been returned to the Duke, but the four boxes containing the drawings of Inigo Jones and others are still retained, by his Grace's request.

The amended Paper of Suggestions for the Conduct of Competitions, considered and adopted by the Institute at a General Meeting held in March, 1892, was issued to Members last June, after it had been finally revised by the Council.

A Bill introduced into the House of Commons last session, intituled "A Bill to empower the City and South London Railway Company to make an underground railway to Islington, and for other purposes," menaced the removal of the Church of St. Mary Woolnoth, which was scheduled with the apparent intention of being acquired for the purposes of a railway station. The Council petitioned against the Bill as it stood, and they believe that the proposal to remove the Church has not been proceeded with.

Attention having been invited to an application made to the Privy Council by the Sanitary Institute, which is incorporated under the Companies Act, for the grant of a Royal Charter, the Council formulated objections to the extensive powers thus sought to be obtained; and a suggestion offered to the Sanitary Institute, that certain clauses of its draft charter should be modified so as to confine its examination to matters of sanitary knowledge, was accepted by the authorities of that Institute. No further opposition was consequently offered by the Council to the grant of the Charter sought for.

By the courtesy of the London County Council, the By-laws proposed to be made by that body under the Public Health (London) Act, 1891, have been considered and reported on by the Practice Standing Committee of the Institute; and the Report having been adopted by the Council, the same was duly forwarded as a series of suggestions for submission to the London Council.

The Appellate Tribunal, to which the Council of the Institute nominate a member, under the provisions of the London Council (General Powers) Act, 1890, is reported to have heard and determined fifteen appeals, which have resulted in the confirmation of nine of the Superintending Architects' certificates appealed against, and of the varying of six others. The tribunal consists of Dr. Longstaff, appointed by the London Council; Mr. Arthur Cates, appointed by the Council of the Institute; and Mr. C. J. Shoppee, appointed by the Council of the Surveyors' Institution; and Mr. Cates is the elected chairman.

The Council have had under consideration a proposal by Mr. Cates to divide the United Kingdom into so-called architectural provinces, of which the Societies now or hereafter allied to the Institute would be the respective centres; and they have conferred with the Allied Societies on this proposal and the manner in which it may be carried out, with a view to promoting, in Great Britain and Ireland, a comprehensive educational organisation, of which the Institute would be the head. In connexion with this subject, the expediency of extending the limit of the number of Presidents of Allied Societies who may sit on the Council, now restricted to nine, has been also considered, and the opinions thereon of the respective Societies have been asked for. Several suggestions have accompanied the replies forwarded by the Allied Societies, and the subject was discussed in Liverpool on the 21st ult., at a Conference* at which representatives from several non-Metropolitan centres attended, and at which the Institute was represented by Mr. Emerson, supported by Mr. Cates and Mr. Slater. The fact that this Conference discussed the educational results which might possibly be achieved under the auspices of each Allied Society at the centres respectively of the projected architectural provinces, rendered the gathering at Liverpool more than ordinarily interesting.

At the beginning of the current Session the Council took into consideration the desirability of memorialising the Royal Commission now sitting, and known as the Gresham University Commission, on the subject of the place to be given to Architecture in the scheme of a Teaching University for London; and the President, on behalf of the Council, addressed the Commission as follows:—

November 21, 1892.

"MY LORDS AND GENTLEMEN,

On behalf of the Council of the Royal Institute of British Architects, I beg leave to ask that in any scheme for the establishment, under charter, of an efficient Teaching University for London, a definite and distinct place may be assigned to Architecture.

In assigning such position, it should be realised that Architecture is both an art and a science, and that it is impossible to divorce its artistic from its scientific attributes. Design in Architecture embraces not only the artistic arrangement of elevations, both external and internal, and the distribution of the whole plan, but also the scientific construction of an edifice.

The curricula established in London by the Architectural Association, and by King's and University Colleges—as well as the programmes of the Progressive Examinations of the Royal Institute of British Architects—demonstrate the comprehensive character of Architecture; while the experience of those of other great cities, both in Europe and America, shows that the idea of such comprehensiveness is neither exaggerated nor new.

The Examination programmes to which I refer are given on pp. 195-218 of The *R.I.B.A. Kalendar* [1892-93], and the course or curriculum of the Architectural Association (London) is also given on pp. 141-146 of the same work.

I beg leave to add that, should the Royal Commission desire it, the Council of the Royal Institute of British Architects will be happy to afford any assistance that may be in their power towards defining the place which Architecture should occupy in any scheme for a new Teaching University.

I have the honour to remain, My Lords and Gentlemen,
Your obedient servant,
J. MACVICAR ANDERSON, *President.*"

The reply received from the Secretary of the Royal Commission—Mr. J. Leybourn Goddard—stated that the Commission would hear evidence on the subject from members designated for the purpose; and, at the request of the Council, the President and the Hon. Secretary, with Mr. Cates and Mr. Slater, attended a meeting of the Gresham University Commission and gave evidence accordingly.

Certain observations which were made by Lord Chief Justice Coleridge in summing up the case of "Burr *v.* Ridout," tried on February 21 last—which appeared to injuriously reflect upon the objects of the Institute, and to give an erroneous view of its Schedule of Professional Practice and Charges—were brought to the notice of the Council; and a letter addressed to his Lordship by the President has elicited an expression of regret which the Council have received with much satisfaction. The correspondence was published, with Lord Coleridge's consent, in the *Journal* of the Institute.

Two important constitutional matters have occupied the serious attention of the Council during the greater part of the official year, namely (1) the method of admitting and electing Fellows, and (2) their qualifications.

The solution of the first question was facilitated by the work of a special committee appointed pursuant to a resolution of the Institute passed at the annual general meeting of 1891. The report of this Committee, which was appointed to consider the provisions of By-law 9, having been adopted by the general meeting of June 13, 1892, the Council were then requested to prepare modifications of By-law 9 in accordance therewith, and to take the steps necessary to obtain the desired alterations. It was found, while considering the provisions of By-law 9 and the best means of modifying them, that other By-laws would be affected by the proposed modifications, based as they were on the clauses of the Report adopted by the Institute and referred back to the Council to carry out. A revision of By-laws 7, 8, and 9 became necessary, and these By-laws as proposed to be altered were submitted to the Institute on March 27, when the alterations were approved with but a slight amendment, and adopted. Certain Regulations made by the Council to carry out the altered By-laws 7 and 9 were submitted at the same time and confirmed by resolution of the Institute. The alterations, as adopted, of By-laws 7, 8, and 9 were confirmed by a Special General Meeting held on the 17th ult.

The solution of the second question was more difficult. Pursuant to the instruction of a General Meeting of the Institute, held on July 11, 1892, the Council took into consideration the whole matter of the qualifications for Fellowship, and submitted their report to the Institute at the general meeting of March 27. A portion of that report, containing a Regulation to carry into effect the Charter and By-laws concerning the qualifications of applicants for Fellowship, which the Council unanimously recommended for adoption, was approved by the Institute; and the Regulation was confirmed by Resolution. The latter portion, however, containing a Declaration under Section 3 of the Charter, as to the advisability of making which the Council were divided in opinion, was, after discussion by the General Meeting, withdrawn.

The report of the whole proceedings relating to the altered By-laws and the Regulations to carry them into effect, and also to the Council Report on the Qualifications of Fellows, appeared in the *R.I.B.A. Journal* of March 30. The same number contained the Memorials presented to the Council on the subjects abovementioned. . . . .

The Art Standing Committee report that they have held eight meetings since their election in June, 1892, making since the issue of the last report nine in all. The functions and scope of the Committee having been defined more precisely than heretofore by the Council, the Committee feel confident they may in future be able to report more satisfactory results of their labours. Subjects

* A portrait of M. César Daly, with a full report of his speech on the occasion referred to, appeared in the *Builder* for July 2, 1892.

* Reported in the *Builder* for April 29 last.

connected with London improvements have occupied much time of the Committee. The various authorities concerned with the reconstruction of Chertsey, Richmond, and Kew Bridges have been approached, and in respect to the two first satisfactory assurances obtained. The Committee also recommended that the Council should address the London Council upon the importance of the new Vauxhall Bridge being built entirely of stone, and advising that measures be taken by the London Council to obtain a design worthy to rank with London and Waterloo Bridges. The Council acted upon this recommendation, but have not received a satisfactory reply. Lincoln Cathedral Library and Cloisters, Emanuel Hospital, The Rolls Chapel, the Wellington Monument, street lamps, and Holy Trinity Church, Clapham Common, each received consideration from the Committee. The Committee strongly recommended the adoption of the proposal, then under consideration by the Council, that candidates for Fellowship should submit drawings and photographs of their executed works. . . .

The Literature Standing Committee report that they have held seven meetings since their election in June, 1892, making since the issue of the last Report eight meetings in all. . . .

The R.I.B.A. Journal of 1891-92 (Vol. VIII.) contained 436 pages, with a few illustrations in the text; and thirteen numbers of Vol. IX. have been published. . . .

The annual volume of *Transactions* (VIII. New Series) contained 434 printed pages and 180 illustrations in the text, and a frontispiece portrait of Professor Donaldson, President 1863-65.

The Committee have at the present time under their consideration, as a reference from the Council, a scheme for amalgamating the *Transactions* with *The R.I.R.A. Journal*, the general principles of which have been approved by the Council; and in view of the suggested alteration in the publications of the Institute and the necessity thereby created for receiving Sessional Papers in their complete form at least four weeks before they are read at a general meeting, the Committee have already in their hands the MSS. of some papers for the next Session, and have promises of several others.

In reference to the elimination from the Library of such books as do not fulfil the objects of an architectural library, the present Committee have continued the work inaugurated in the previous Session, and several volumes have been removed. An important increase has been thereby made in available shelf-room, while, in addition, new cases have been fitted up, from the designs of Mr. Aston Webb, in the old Council Room. The Committee appointed Professor Aitchison Chairman, and Mr. Alex. Graham Vice-Chairman. They also appointed Mr. R. Elsey Smith and Mr. A. S. Flower Hon. Secretaries. . . . .

The Practice Standing Committee report that they have held three meetings since their election in June, 1892; and a Sub-Committee delegated for the purpose have also had two conferences with representatives of the Institute of Builders on the subject of the Conditions of Contract. The result of these conferences was embodied in a reprint of the Conditions, which, after adoption by the Committee, was submitted to the Council, and is still under consideration.

The Committee have also given careful consideration to the By-Laws proposed to be made by the London Council under the Public Health (London) Act 1891, and have reported to the Council, with suggestions for several alterations, giving the reasons for such suggestions.

The Committee appointed Mr. Henry Currey Chairman, and Mr. Arthur Cates Vice-Chairman. They also appointed Mr. Thomas M. Rickman and Mr. Edwin T. Hall Hon. Secretaries.

The Science Standing Committee report that they have held eight meetings since their election in June 1892, which have been attended, on the average, by twelve members. . . . The desirability of a code of sanitary regulations for the entire United Kingdom was considered by the Committee, but the subject belonging more exclusively to the Local Government Board, the Committee did not see their way to move in the matter. The general principles of the Report of the Committee on Light and Air were adopted at the business meeting of March 13, 1893; and, the reconsideration of details being now proceeded with, the Committee hope to report again to the Council at an early date. The Committee have had their attention directed to several inventions and new materials for building construction, but considered none of them of sufficient importance to demand a special report. . . . The Committee appointed Mr. Lewis Angell Chairman, and Mr. P. Gordon Smith Vice-Chairman. They also appointed Mr. William C. Street and Mr. H. D. Searles-Wood Hon. Secretaries.

Early in the official year the Council obtained the assistance of a professional accountant, with a view to simplifying the accounts and amending the form of balance-sheets annually issued; and they received from him a report, on which they have advantageously acted. From January 2, 1893, a less complicated system of book-keeping than was hitherto employed in the Secretary's office has been in use; and a revaluation of the Institute property has been made by Mr. Wyatt Papworth and Mr. T. M. Rickman. The accounts of income and expenditure, and the Balance Sheets of the year ended December 31, 1892, have been prepared under the advice and with the assistance of Mr. Saffery, Chartered Accountant, before referred to. . . .

The sum of about 2,600*l.* has been expended during the four years 1890-93 on exceptional items—in other words, in the purchase of Architectural Union Company's Shares, in building, fittings, furniture, &c.—over and above the amount acquired from the sale of stock authorised in 1890. Of this sum an amount of about 1,000*l.* has been paid from ordinary income and entrance fees, during the four years alluded to; and the balance of about 1,600*l.* still remains unprovided for. The Council, therefore, on the recommendation of their Finance Committee, propose to sell stock to the amount of about 1,300*l.*, to meet the greater part of the anticipated deficit, and to leave accounts to the value of about 300*l.* outstanding—the same to be paid out of the balance of receipts over disbursements in 1894.

The large sum annually spent, for several years, upon the new series of *Transactions*, has not escaped the attention of the Council. They are of opinion that it may be considerably reduced, without seriously curtailing the amount of information now published by the Institute. To this end they appointed a Committee of their body, to consider the points raised by the President in the Address he delivered at the opening Meeting of the present Session, when treating of the *R.I.B.A. Journal* published fortnightly, and the annual volume of Transactions; and to report upon the whole question. The Committee found that the net cost of the two separate publications—the *Journal* and the *Transactions* for the two years 1891 and 1892—was in round numbers 2,750*l.*; and, after careful consideration, they reported that were the annual volume of *Transactions* to be merged into the fortnightly *Journal*, the latter might be published at a net cost of about 1,750*l.* for two years; this estimate including a sum for additional assistance in preparing the *Journal* for publication. An annual saving of 500*l.* would thus accrue; and the Council are so convinced of the necessity of effecting such an economy, that they earnestly recommend the Institute to allow the proposal to take effect at once. Several of the papers read at the general meetings of the current Session have already appeared in full, with illustrations, or in comprehensive abstract, in the *Journal*; and other papers read during the Session of which short abstracts only have appeared can be published in full in the remaining issues for 1892-93. Under these circumstances the Council have decided not to print a volume of *Transactions* this year, and they confidently advise the Institute to allow that publication to terminate with the volume last issued, which was the eighth of the new series.

Should this meet with approval, the first number of the enlarged *Journal* can be published at the opening of the next Session, and continue periodically, giving the full paper read at a general meeting, with the necessary illustrations and the discussion upon it; the issue to take place on the Thursday following such meeting.

If the outlay required for a volume of *Transactions* be excluded, the receipts for 1893 may be expected to show a margin of between 600*l.* and 700*l.* in excess of disbursements; but it should be clearly understood that that balance has been already appropriated to partly paying off the exceptional expenditure of the last four years, 1890-93.

The Income and Expenditure Account and the Balance-Sheet of Ordinary Funds for the year ended December 31, 1892, were appended to the Report.

NEW ACADEMICIANS.—At a general assembly of the Academicians and Associates of the Royal Academy on the 4th inst., Messrs. John MacWhirter, Henry Woods, and Henry Moore were elected Academicians, and Mr. John W. North, painter, an Associate.

COMPETITIONS.

THE SMALLWOOD HOSPITAL, REDDITCH.—In a limited competition the design of Mr. William Henman, architect to the New General Hospital, Birmingham, has been selected, on the recommendation of Mr. Alexander Graham, F.R.I.B.A., to whom the designs were submitted under numbers, and Mr. Henman has been appointed by the trustees to carry out the work.

PUBLIC LIBRARY, HIGH HOLBORN.—We are informed that the Commissioners for Public Libraries for the St. Giles's district have just concluded an examination of designs which have been submitted in competition for the erection of a Public Library in High Holborn. The designs will be open for inspection at the offices of the Commissioners, 197, High Holborn, Monday, Tuesday, and Wednesday next, between the hours of 10 a.m. and 4 p.m.

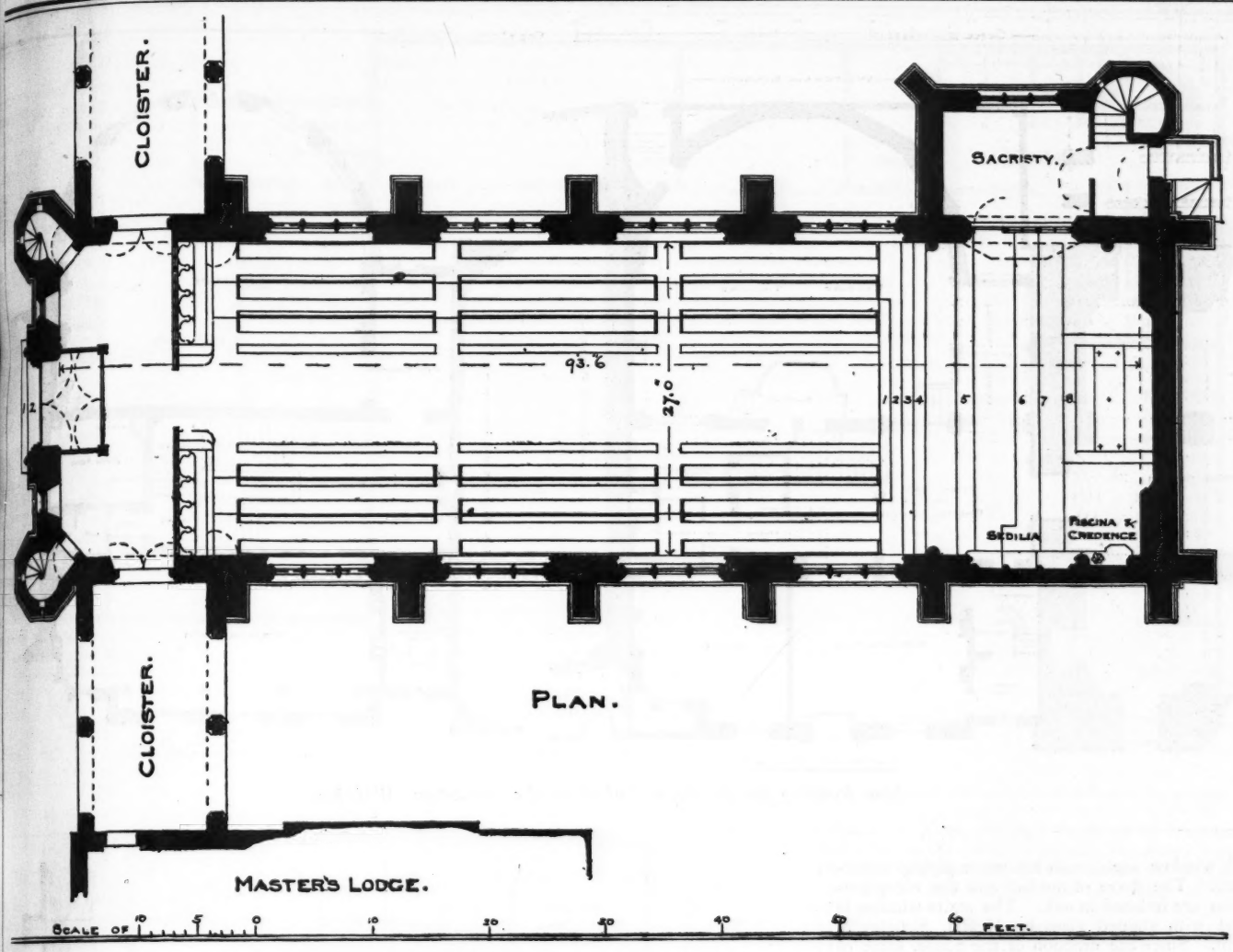
WALSALL WOOD DISTRICT SEWERAGE.—The Brownhills Local Board recently selected four engineers to submit schemes of sewerage and sewage disposal for the districts of Walsall Wood, Shelfield High Heath and Clayhanger, comprising a population of about 6,000. The Local Board has decided in accepting the scheme prepared by Mr. H. Bertram Nichols, C.E., of Birmingham, who, at the last meeting, was appointed the engineer to carry out the works. It is intended to proceed with the works immediately. The cost of the schemes is estimated at 9,000*l.* The other schemes submitted were those of Mr. J. D. Willcox, C.E., Birmingham, Mr. W. H. Radford, C.E., Nottingham, and Mr. W. Perry, C.E., Lichfield, all of which received close attention, but the scheme of Mr. Nicholls being more comprehensive and more suitable to the requirements of the district, decided in his favour.

ARCHITECTURAL SOCIETIES.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—The sixth annual meeting of this Society was held at the School of Art on Tuesday evening. Mr. Innocent, the retiring President, presided, and there were present also Mr. T. J. Flockton, Mr. J. B. Mitchell-Withers, Mr. E. M. Gibbs, Mr. C. Hadfield, Mr. W. F. Hemsoll, and many of the members. The reports of the hon. secretary and treasurer were read and adopted. From them the Society appears to be in a flourishing condition, and the classes for the study of design, architectural history, and sketching, naugurated in the early part of the session, under the management of Mr. Gibbs and Mr. J. R. Wigfull, were attended by a good number of young architects, supplying a much needed educational want in the City. A beginning also had been made towards the formation of an Architectural Library. A ballot took place for the election of President, Vice-President, officers, and Council for the ensuing session, Mr. T. Winder and Mr. C. Gibson being the scrutineers, with the following result:—President, Mr. E. M. Gibbs; Vice-President and Treasurer, Mr. J. B. Mitchell-Withers; Hon. Sec., Mr. C. Hadfield; Council, Messrs. T. J. Flockton, F. Fowler, C. J. Innocent, J. Smith, and W. C. Fenton. A vote of thanks was awarded to the retiring President, Mr. Innocent, for his two years' services. Mr. C. Hadfield, Hon. Sec., then read an interesting paper on "The Church of St. Peter at Rome, or the Vatican Basilica," which he had visited during the recent Papal Jubilee in February last. The architectural history of this celebrated building was carefully reviewed in detail and the lecture well illustrated by lime-light views.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Under the leadership of Mr. John M'Lachlan, architect, Edinburgh, the members of this Association, to the number of twenty, visited on the 6th inst. Nunraw Castle, Haddingtonshire, the property of Mr. Wingate Gray. Mr. M'Lachlan, in his descriptive account of the castle, said that Nunraw, as its name indicated, was a nunnery before the Reformation, and was an appanage of the Abbey of Haddington. One of the most recent members of the house, in 1860, determined to restore the building to the condition in which it originally had been, but it remained a question whether the restoration had not been over-done. Scarcely a vestige of the original building remained visible. On behalf of the Association, Mr. Robertson, the President, thanked Mr. and Mrs. Wingate Gray for their kind reception and hospitable entertainment.

GLASGOW ARCHITECTURAL ASSOCIATION.—The usual monthly meeting of this Association was held in the Rooms on the 2nd inst., when a



PLAN.

Chapel, Selwyn College, Cambridge.

paper was read by Mr. John A. Macara, M.A., B.Sc., on "Monuments and Memorials of the Dead." Dealing with the subject in an historical manner, the lecturer described in detail and by means of lantern slides a great variety of tombs and monuments of the different periods of architecture. Egypt was first noticed, and an account given of the Pyramids and the other commemorative monuments of that country. Passing on, he alluded to the monumental remains of Assyria, Greece, and Etruria. Roman remains of this kind are also very numerous, and exhibit many points of interest to the architectural student. Touching briefly on the monumental art of Medieval and Renaissance times many interesting examples were shown. A short discussion followed, and at the close a hearty vote of thanks was awarded the lecturer.

ALTAR, ST. DAVID'S CHURCH, PANTASAPH, FLINTSHIRE:—On the 4th inst. the Rev. Dr. Scarisbrick consecrated, at St. David's Church, Pantasaph, near Holywell, a new high altar which has been erected to their father's memory by the children of the late Earl of Denbigh, the founder of the church, and of the adjacent Capuchin monastery. The tabernacle is of alabaster, with brass ornamental doors. Above the tabernacle the throne is supported by eight angels, also in alabaster, the pillars supporting the canopy over the throne being of Devonshire marble; and at the points of the throne canopy are four other figures of angels. Two further canopies, surmounted by a spire, finish the erection. Open buttresses support the canopies on either side, the character of the whole being Gothic, Early English Decorated, and worked in Caen stone, the height from pedela to finial being 20 ft. Two super-altars have also been added, of Pandemar marble. The large crucifix previously fixed above the screen dividing the sanctuary from the friars' choir has now been removed, and depends from the apex of the arch at the entrance to the sanctuary. The work has been carried out by Messrs. Boulton & Sons, sculptors, Cheltenham, from designs prepared by Mr. Purdie, architect, Chelsea. Within the sanctuary there has also been erected by the Dowager Countess of Denbigh, to the memory of the late earl, a monument, surmounted by a recumbent statue of the Earl of Denbigh. The statue is worked in Portland stone.

Illustrations.

THE CHAPEL, SELWYN COLLEGE, CAMBRIDGE.

THIS Chapel, now in progress, from the designs of Sir A. Blomfield, A.R.A., is one of the group of buildings forming the original plan made for the College in 1879. When complete they will enclose a quadrangle 213 ft. by 202 ft. The west end of the chapel will be the central feature of the eastern side facing the entrance gateway. Like the rest of the College, the building is of red brick and Ancaster stone. The roof will be of oak, open timbered.

The present contract only includes the shell of the building, without fittings.

Messrs. Cornish and Gaymer, of North Walsham, are the contractors.

The drawing is exhibited in the Royal Academy.

THE ROYAL UNITED SERVICE INSTITUTION, WHITEHALL.

THIS building is now in course of erection at the south end of Inigo Jones's Banqueting Hall in Whitehall, which has been lent by the Queen to the Institution for the accommodation of their very interesting naval and military museum.

The Banqueting Hall itself remains practically unaltered, but the crypt below, which is brick-vaulted, and had been much cut up with caretakers' rooms, coal-cellars, &c., has been cleared out, the windows (which were blocked up in the beginning of this century) opened out, and the wall and piers lined to the springing of the vaults with oak panelling. This crypt will be used for the exhibition of the heavier objects in the museum, for which it is admirably adapted.

The new building will contain a lecture-theatre to seat about 500 people, and a large reference-library over, both of which face Whitehall Gardens; a large reading and writing-room, and a similar room for maps, &c., and for the game of Kriegspiel; also a Council Room, Secretary's and clerks' rooms, large newspaper room, caretakers' quarters, &c., and a passenger lift. The accompanying plans will explain the arrangements.

Care has been taken that the new building should not interfere with the architectural effect of the Banqueting Hall, and with this view the building is set back a distance of 8 ft., where it adjoins the Banqueting Hall, on both elevations, this portion being left perfectly plain, so as entirely to detach the new work from the old; this setting back has the additional advantage of leaving the return pilasters of the Banqueting Hall untouched.

The Whitehall front is in Portland stone, with a plinth and entrance doorway of granite, and the enriched frieze and other sculpture will be executed by Mr. Frith. The elevation towards Whitehall Gardens is of Portland stone and white Suffolk bricks. The building is fireproof throughout, roofs and floors. The contractors are Messrs. Mowlem & Co., and the clerk of works is Mr. G. Berry. Messrs. Aston Webb and E. Ingress Bell are the architects.

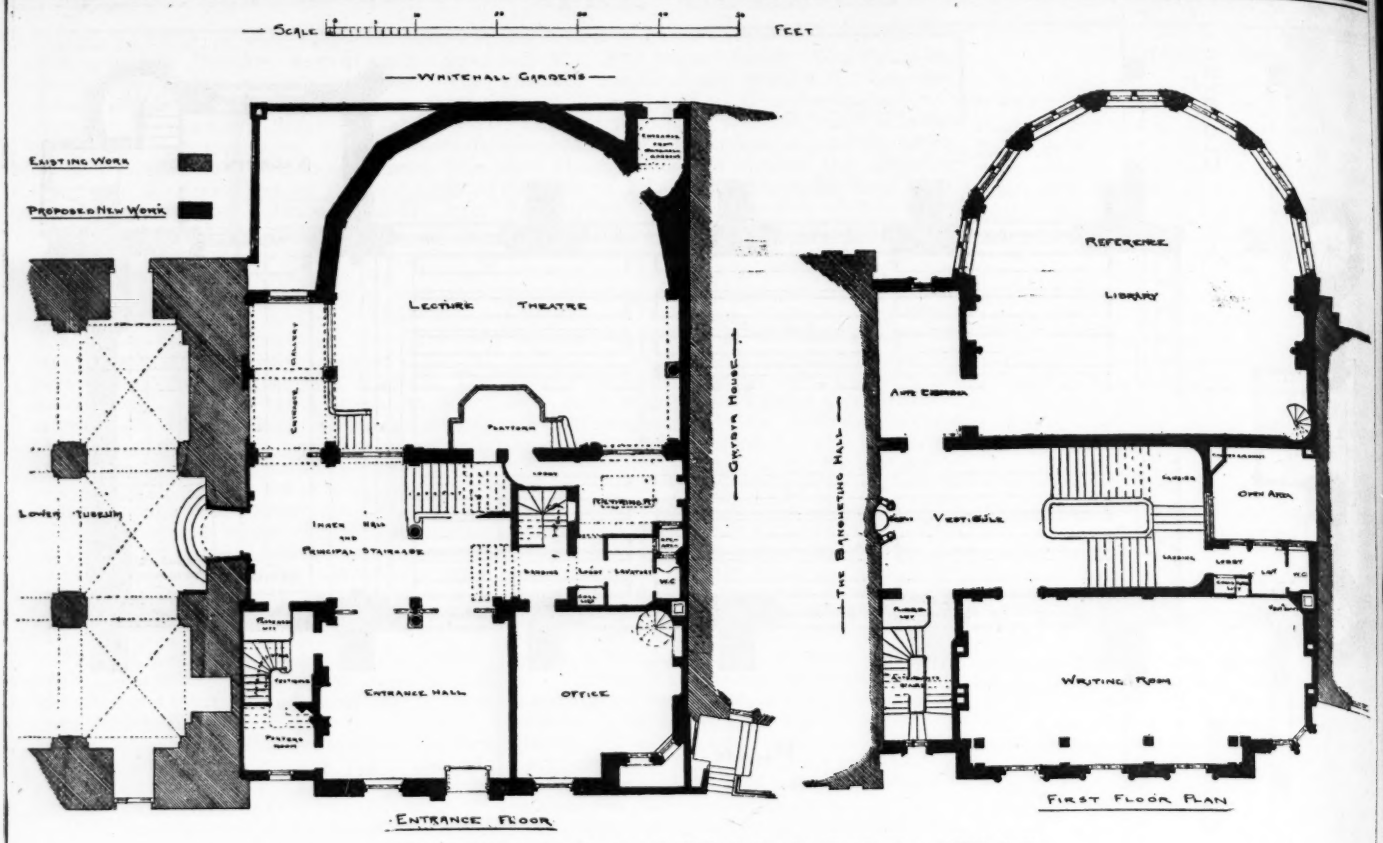
We hope to publish later the enlarged elevation, which, together with these views, is now at the Royal Academy.

The memorial stone is to be laid on June 6, by H.R.H. the Prince of Wales.

"QUARRYDENE," WEETWOOD, NEAR LEEDS.

"QUARRYDENE," the residence of Mr. J. Rawlinson Ford, J.P., is situated at Weetwood, a favourite suburb rather more than three miles distant from the centre of Leeds.

The house and stables are built of local stone, and are slated with green Westmoreland slates. All the interior fittings were specially designed by the architect. The drawing-room is provided with an "ingle-nook," with settees on either side of the fireplace. The walls are divided into bays with Ionic pilasters, and a deep frieze is carried round the room, with modelled ornament in relief, the ceiling being panelled and enriched with moulded ribs. The dining-room is wainscoted to within 2 ft. of the ceiling, and is painted wall-flower colour, and above it is a deep amber-toned frieze. The large bay windows are all fitted up



New Building for the Royal United Service Institution, Whitehall.

with window seats, with hot-water piping underneath. The floors of the hall and the reception-rooms are finished in oak. The stairs window is filled with stained glass by Messrs. Shrigley & Hunt. Since the erection of the house, some of the rooms have been decorated by Miss Agnes Garrett, of London.

The illustration shows the garden front of the house. The work was designed and carried out by Mr. William H. Thorp, architect, Leeds.

GATE-LODGE AND STABLING, CHERTSEY.

THIS building, which was executed by Messrs. T. Knight & Sons, of Chertsey, consists of gate-lodge and coachman's house of two stories in front, with stable yard and coachhouses, and stabling in rear, with hayloft and pigeon-cote over washing box.

The ground floor story is faced with red brick, and the upper part of lodge is in the old half timber style, with Broseley tile roof, and lead glazed windows.

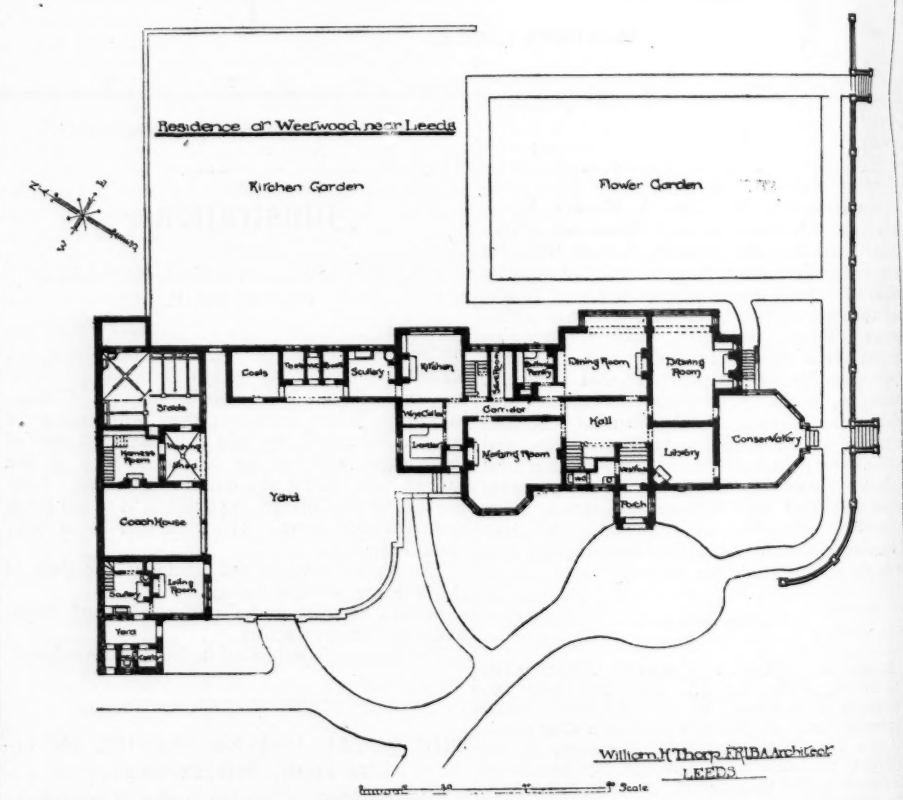
The stable fittings were supplied by Messrs. Musgrave, of Belfast.

The architects are Messrs. Wimperis & Arber.

STATION HOTEL, FLEET, HANTS.

THIS hotel has been erected for Mr. Thomas Kenward, of Winchfield, in a commanding position immediately opposite the station, and contains on the ground floor a large dining-room, bar, parlour, a spacious hall, lavatory, and w.c., with the usual kitchen offices; on the first floor, six good bed-rooms, bath-rooms, and w.c.; on the second floor, six bed-rooms and a w.c. The basement contains large beer and wine cellars. There is erected, adjoining it, stabling to accommodate fourteen horses, with good coach-house and covered shed for visitors' traps, &c. It is intended to make entensive tennis courts and pleasure gardens at the rear of the hotel. The materials used are red bricks and tiles, supplied by Messrs. Thomas Lawrence & Sons, Bracknell. The whole of the exterior walls are built hollow. The buildings have been erected at a total cost of about 2,650*l.* by Mr. G. Brown, builder, Bracknell, under the superintendence of the architect, Mr. F. H. Tulloch, of Westminster.

REMOVAL.—Messrs. Horne, Son, & Eversfield announce the change of their City address from 84, Basinghall-street, to 85, Gresham-street, as their present premises in Basinghall-street are required for an extension of the City of London Court.



"Quarrydene," Weetwood, Leeds.

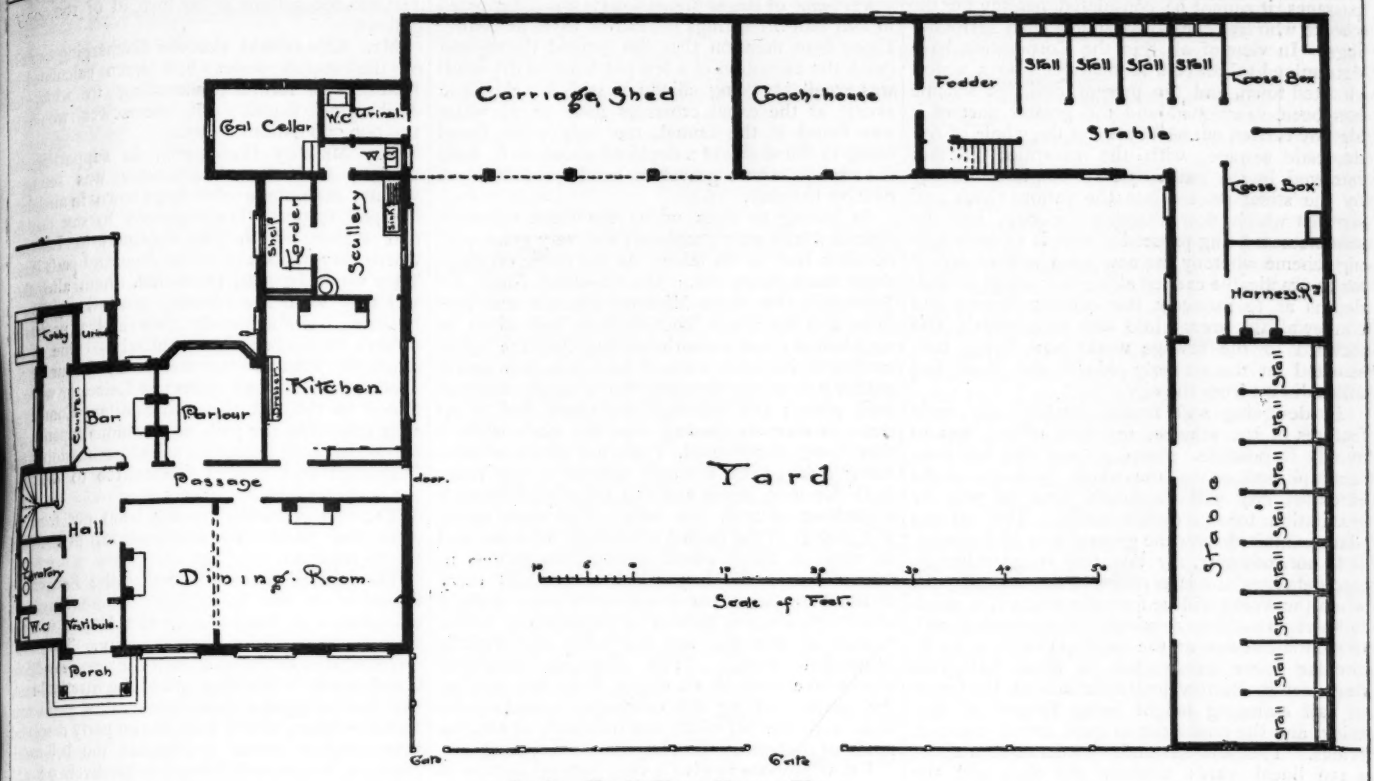
INCORPORATED ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS:

MEETING AT MANCHESTER.

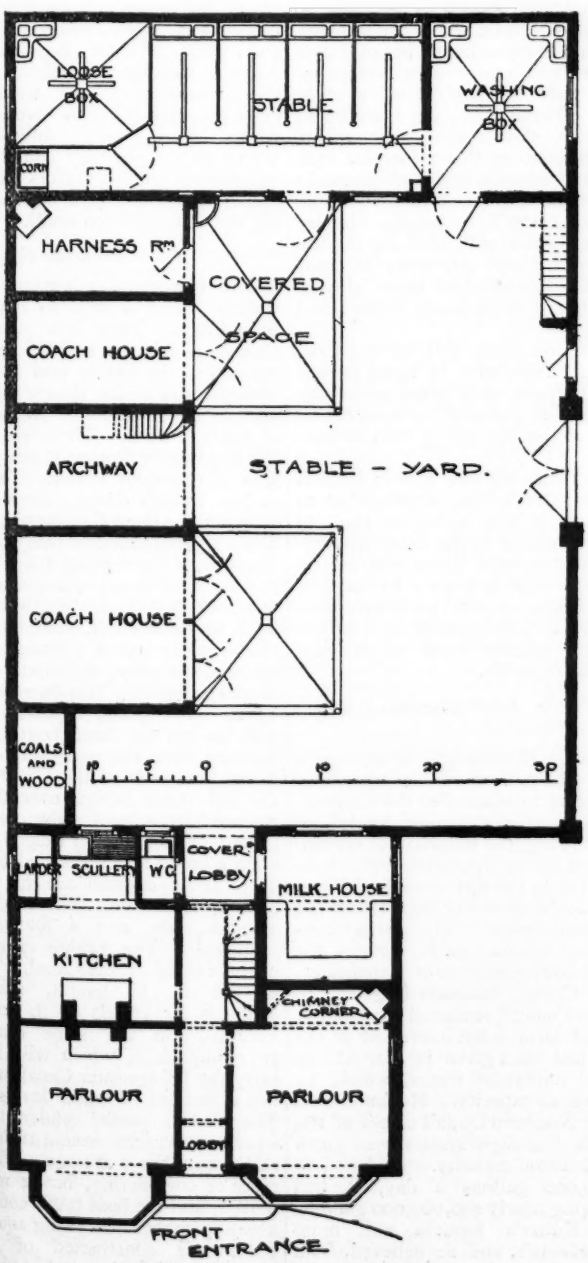
ON Saturday last a very successful meeting of the members of this Association was held at Manchester, under the auspices of the Lancashire and Cheshire District.

Assembling at 11 a.m. in the Mayor's Parlour of the Manchester Town Hall to the number of about 120, the members were formally received and welcomed by the Mayor (Mr. Alderman Marshall), who remarked that Manchester had made and was making great strides in its various sanitary works. The new main sewerage works which the members were to visit were approaching completion. They had cost a large sum, but it was believed that they would confer great benefit upon the city. So far, thanks to the care and ability of the City Surveyor, the Corporation were able to congratulate themselves upon the successful way in which those works had been carried out. He trusted that what had been done would commend itself to the approval of the body of experts whom he saw before him, and they would be glad, as they always were, to give any information on points of detail. The Mayor having vacated the chair, it was taken by Mr. J. Cartwright (Borough Engineer of Bury), President of the Association, who, on behalf of the members of the Association present, thanked the Mayor for his hospitable welcome.

On the motion of the President, seconded by Mr. McBeith, and supported by Mr. Wilson,



Station Hotel, Fleet, Hants: Plan.



Gate-Lodge and Stabling, Chertsey.

Mr. S. S. Platt, Borough Surveyor of Rochdale, was re-elected Hon. District Secretary, warm acknowledgment being made of his untiring energy in the discharge of the duties of that office.

The Manchester Main Drainage Works.

Mr. Allison, the City Surveyor, then read the following paper, describing the salient features of the new main drainage works. He said:—

Previous to 1885 the boundaries of the City of Manchester were exceedingly limited, having only an area of 4,294 acres, and a population of 341,414; and allowing about 300 acres unbuilt upon on the northerly side of the City, and about 300 acres for shop and warehouse property in and near the centre of the city, where there is no resident population, the residential area would be reduced to about 3,694 acres, which averages ninety-two persons per acre. In 1885 two Local Board Districts and one Rural Sanitary Authority were added, increasing the area to 5,927 acres; and again in 1890 by Provisional Order other six Townships were added comprising an area of 6,861 acres, so that to-day the total area of the City is 12,788 acres, and the population about 515,600.

Manchester has for a very long time been credited with a high death-rate, and possibly you will agree with me that after allowing for the area covered by streets and passages this number of persons per acre could not be considered a satisfactory condition of affairs. During the past four years the Sanitary Committee have had under consideration the over-crowded condition of the old city, which is mainly due to narrow streets in the working-class districts, such streets ranging from 12 ft. to 24 ft. in width, the back passages having an average width of from 3 ft. to 3 ft. 6 in. very few indeed measuring 4 ft. wide. In this crowded area also there were about 9,240 back-to-back houses abutting upon these narrow streets; and so impressed were the Sanitary Committee with the evils arising from this class of property that they resolved some three years ago that something must be done to give freer ventilation and improved sanitary accommodation, and they have accordingly within that period dealt with about 1,100 of these dwellings, 340 of which have been entirely demolished, and the remainder altered to suit the Committee's requirements, or closed as dwellings. There still remain about 8,000 to be dealt with.

Originally Manchester might be considered a privy and midden town, but in 1871 the Health Committee adopted the pail-closet system, which, no doubt, was a great improvement on the old midden system; but even with this system there are many objectionable features, as the pails can only be emptied on an average of say twice a week, and as the contents are stored up in these small yards and narrow

passages, it cannot be considered healthy for the people who live constantly amidst such surroundings. In view of all this, the Corporation have determined to convert Manchester into a water-closeted town, and the present drainage scheme has been sanctioned and the greater part of it already carried out. At present the whole of our domestic sewage, with the exception of that removed by the pail-closet system, finds its way by the street sewers into the various rivers and streams which flow through the city, and the scheme now being proceeded with is an intercepting scheme whereby the new main sewers are as far as practicable carried along the valleys at such depths as to intercept the existing sewers and convey all the sewage into one main outfall, and forward to the sewage works now being constructed on the westerly side of and about five miles distant from the city.

In designing and finally settling the main features of the scheme, my first object was to avoid, if possible, pumping, and this has been accomplished, so that the whole drainage of the extended city will eventually find its way by gravitation to the outfall works. The cartoon plans exhibited show the general line of drainage. It is not, however, my intention to go minutely into detail, as at a later period of the present year, when the works will be formally opened, a much fuller report will be required. Commencing with the outfall sewer at the works, this is a 10 ft. circular sewer constructed in three half-brick rings, set in Barrow hydraulic mortar, the invert to half springing height being formed of blue brick, and the remainder in good sound common bricks. This sewer extends for a distance of about 4,259 lineal yards towards the city, and the greater portion of it has been done in open cutting, one half the length being about 15 ft. in depth to the invert, while the remaining length nearer to the city is at a depth of from 18 ft. to 35 ft. At the point where this sewer terminates a storm overflow chamber has been constructed, as, owing to the very flat character of the district, only a very small percentage of the storm water can be got quit of before reaching this point. This chamber serves a double purpose; it gets rid of a large volume of storm water in time of flood, and it has enabled me to reduce the size of the sewer below this point, and at the same time reduces the volume of flood water to be dealt with at the works. The storm overflow chamber, which is intended to be inspected to-day, measures 51 ft. 6 in. by 27 ft. 2 in., and a crest or weir the full length is formed along the side of the sewer, so that in time of flood all the storm water delivered by the larger sewer, when running at a depth of more than 6 ft., will overflow and find its way along the storm overflow to the Ship Canal below the Mode Wheel Locks, where the surface of the water in the Canal is lowered to the extent of 13 ft. The water passing along the storm overflow being so largely diluted, will be allowed to be passed into the Canal without chemical treatment.

In the construction of the 10 ft. sewer few difficulties were encountered, except in carrying it under the Bridgewater Canal at two different points, and in both cases the work was done in open cutting. In order to enable the canal traffic to be carried on continuously, the work in each crossing was done in two sections, by means of coffer-dams, and it was found necessary to widen the canal temporarily in order to obtain sufficient width for the barges to pass. Owing to there being insufficient depth between the bed of the canal and the upper surface of the work, I had to construct the work with cast-iron cylinders in five segments for the 10 ft. sewer; and in the other case, where there was still less depth, two cast-iron tubes 8 ft. 9 in. diameter, in segments, had to be introduced. To-day, facilities will be given for you to examine this work, and also the storm overflow chamber, so that further description is unnecessary.

On the city side of the storm overflow chamber a much larger sewer has been constructed, and in order to avoid pumping, and to secure sufficient carrying capacity at a low level in the sewer (and also to get under three railways and various sewers), a special design had to be resorted to, so that instead of carrying forward a circular sewer, it has been carried out more of an oval shape, the internal dimensions being 14 ft. long by 10 ft. 6 in. The length of this sewer from the storm overflow chamber to the city boundary in Stretford-roac measures 3,535 yards, the depth for the entire length varying from 37 ft. to 45 ft., two-thirds of it being carried out in tunnel and one-third in open cutting, all being constructed with similar materials to the 10-ft. sewer, except that this sewer being of larger dimensions it was constructed in four half-brick rings instead of three as before. I may here mention that the ground throughout (with the exception of a few pot-holes of dry sand) was excellent, being chiefly of stiff dry clay, and except at the canal crossings little or no water was found in the tunnel, the only water found being in the shafts at a depth of about 10 ft. from the surface, where gravel or sand for this depth overlay the clay.

In having to cross under the three railways, special works were necessary, and very great precautions had to be taken, as the traffic on those three main lines, viz.: the Cheshire Lines for Liverpool, the Main Midland London and local lines, and the South Junction lines, had all to be maintained; and notwithstanding that the upper surface of the brick work of the sewer was nearly within 2 ft. of the sleepers, not a single accident took place; and although the trains had in all cases to slow in passing over the work while it was being constructed, I am not aware of them being delayed for a single minute at any time. Both the 10-ft. sewer and this are carried out with a gradient of 2 ft. per mile. The 10-ft. sewer will convey to the outfall when fully at work and in time of flood, about 100,000,000 gallons in twenty-fours; the larger size sewer will carry forward to the storm overflow in time of flood about 170,000,000 gallons in twenty-four hours. Sewers of this size are not often met with in Municipal work. [The diagrams exhibited showed the work in all stages, from first sinking the shafts, driving the headings, extending the same until the full width was obtained, as also the mode of timbering, drawing the timber, &c.]

I now propose to give a very general outline of the works at the outfall. There are at present provided eleven tanks, each 300 ft. long by 100 ft. wide, having an average depth of 6 ft., equal to a water surface area of 7½ acres in the tanks, and a holding capacity upwards of 12,000,000 gallons. It is intended to use sulphate of alumina and lime as precipitants, but of course the tanks can be worked by any other precipitant which may from time to time be of a more suitable character. These tanks are constructed upon the continuous flow system, but unlike many others constructed on this principle, each tank is worked independently, and if all the tanks were at work simultaneously the sewage would be flowing over a crest 1,100 ft. in length. In dry weather the effluent water will, after leaving the tanks, be passed over about 300 acres of land, part of which the Corporation have already secured, and which will be properly drained and used for filtration.

The sludge from the tanks will be conveyed into the works and dealt with in eight presses provided for the purpose, each press containing forty-five chambers, with plates 41 in. square, and said to be capable of turning out 1½ tons of cake per hour.

The cost of the entire scheme now in hand is estimated at about half a million sterling, but as several townships have been added to the city since the scheme was passed by the Local Government Board, about 100,000*l.* extra will be required to sewer these new districts. In concluding these remarks I have to add that I have been assisted by Mr. W. T. Olive, acting as Resident Engineer, with an efficient staff of assistant engineers and clerks of works.

In the course of a brief discussion which followed,

Mr. A. M. Fowler (Stockport), in moving a vote of thanks to Mr. Allison for his paper, said it was very satisfactory to learn that the Corporation of Manchester was abandoning the tub or pail system and adopting the water-closet system. The result could not but be beneficial, not only to Manchester itself but to the surrounding districts, who would all no doubt sooner or later follow the example set by Manchester. The partial continuance of the pail system was, he thought, the only blot on the sanitary scutcheon of Manchester.

Mr. W. Santo Crimp, Assistant-Engineer to the London County Council, seconded the motion. He said that he had been much interested in the description which had been given by Mr. Allison of these large and important works, which, he thought, were of ample capacity. He found that the capacity of the Northern Outfall Sewer of the Metropolitan Main Drainage system was much greater than its calculated capacity. Designed to discharge 300,000,000 gallons a day, it was capable of discharging nearly 400,000,000 gallons. He found that Kutter's formula was more accurate than Eytelwein's, and he believed, from his experience, that the new Manchester Outfall Sewer would be capable of discharging 140,000,000 gallons a day instead of 100,000,000 gallons.

Mr. Allison said that the discharging capacity of the outfall sewer had been calculated by Beardmore's formula, according to which the discharging capacity of the sewer would be 129,000,000 gallons a day.

Mr. Mawbey (Leicester), in supporting the motion, said that Manchester was setting a salutary example to other large towns in abolishing the pail system. He regretted to say that the pail system still largely obtained in Leicester, where they had six or seven thousand pails in use. They would be glad to abolish them altogether, and they were now refusing to allow any more to be used. Unfortunately they had at present no powers to abolish them entirely. One of the strongest possible arguments in favour of the abolition of the pail system in Leicester was contained in the fact that the Sanitary Committee, after collecting the pails at enormous expense, had on two or three occasions asked permission of the Highways and Sewers Committee to discharge the contents into the sewers.

The vote of thanks having been put from the chair and passed by acclamation, Mr. Allison briefly replied.

The visitors then adjourned to the Banquetting Chamber of the Town hall, where they were entertained at luncheon by the Mayor, who was warmly thanked for his hospitality. They afterwards started in brakes to visit the sewage and Ship Canal works. Driving along the Stretford-road, the first stoppage was made at a point near Erskine-street, where most of the party descended into the new sewer to inspect the bell-mouth junction, where two sewers, respectively 9 ft. and 7 ft. diameter, joined the large one measuring 14 ft. by 10 ft. 6 in. Resuming the carriages, the visitors were driven through Trafford further towards the outfall, and at one of the points where the sewer crosses under the Bridgewater Canal they again descended into the works, and inspected the flood-gates, sluices, and storm over-flow chamber. Again taking to the carriages, they were driven to the extensive precipitation works at Davyhulme, which were very fully inspected. The works seem to be very complete in themselves, but several of the visitors expressed it as their opinion that the area of land acquired for purifying the effluent is too small.

The Manchester Ship Canal.

The visitors after leaving the sewage works walked across a field to Barton Locks, on the Ship Canal. They first passed over the flood sluices, which are situated across the byewash channel of the Canal, and consist of four large wrought-iron sluice doors, each giving a clear opening of 30 ft. wide, and holding up a depth of water of 26 ft. These will be used for passing the flood water flowing down from the drainage area of the river Irwell. The sluices are built to Mr. Stone's design, the water pressure being supported on live rollers running between iron rails. The weight of the doors being counterbalanced, the sluices can be regulated by hand-power. The locks are of massive construction, consisting of one lock 600 ft. in length between the gates, 65 ft. in clear width, with inner gates to reduce the length to 450 ft.; also a smaller lock, 350 ft. between the gates, with inner-gates to reduce the length to 230 ft. The water-level here is raised 15 ft. The gates, capstans, lock sluices, &c., will be worked throughout by hydraulic power. Leaving here the party walked for about a mile along the bank of the Canal to Barton. Here the old stone bridge over the river has been replaced by a steel swing bridge spanning the Canal. This structure weighs 600 tons, revolving upon a broad race supported by sixty-four rollers. Two Hyde engines are in the foundation for turning the bridge. The roadway is paved with wooden setts, and a footway is provided on each side. The bridge is carried on a pier in the centre of the Canal. The swing portion is 196 ft. in length, affording two clear openings for vessels 90 ft. and 60 ft. in width. Founded on the same central pier is the swing aqueduct, which will be shortly used to carry the Bridgewater Canal over the Ship Canal, the difference of water levels being 27 ft. 6 in. The visitors passed under the existing stone aqueduct, the achievement of Brindley one hundred and twenty-five years ago. This is an admirable piece of engineering, but it must shortly be removed, and the boat traffic conducted through the new approaches and swing aqueduct. The swing portion is constructed of wrought iron, is 235 ft. in length, and weighs when full of water 1,400 tons. At the centre it is supported

partly by sixty-four rollers running on a wide circular race, and partly by a Hyde press. The bridge carries a waterway of 19 ft. in width and 6 ft. depth of water, and the towing-path is carried by a kind of gallery. In order to allow vessels to pass up the Ship Canal, the operation of swinging this aqueduct is simple. The water-gates on the abutments of the approaches are closed, also the gates at each end of the swing portion; the watertight stop-piece forming the intermediate connexion at each end is raised; the swing portion is thus disconnected from the abutments, and the aqueduct will swing over the central pier, affording two ample openings for vessels 90 ft. wide each up and down the Canal. Both the bridge and aqueduct will be operated from an elevated lever box on the central pier. It is intended, after the removal of the old aqueduct, to erect on the site an hydraulic lift for the transference of barges from the higher to the lower canal, or *vice-versâ*.

Mr. E. Leader Williams, the Chief Engineer, was unable to be present at the time of the visit. The party were met at Barton Locks by the Resident Engineer of the District, Mr. C. D. N. Parker, who accompanied them, and explained the details of construction and the method of working the swing viaduct and aqueduct.

The visitors were much impressed by the monumental character of the work, which is now so far advanced that it is confidently hoped that the Ship Canal will be completed and opened for traffic throughout in February next. After warmly thanking Mr. Leader Williams and the Ship Canal Company for kindly allowing the members to visit the works, and Mr. Parker for his kindness and courtesy in explaining them, the proceedings of the meeting terminated, and the party drove back to Manchester.

We propose, on an early occasion, to give some further details of this great work.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of this Council was held on Tuesday afternoon last at Spring Gardens, the Chairman, Mr. John Hutton, presiding.

Proposed Improvement near Waterlow Park.—On the recommendation of the Parks Committee, it was resolved, after a long discussion,—

"That the Vestries of St. Pancras and Islington be informed that in the event of their proceeding, under the terms of Michael Angelo Taylor's Act, to acquire a strip of Waterlow-park for the purpose of widening Dartmouth-park-hill, the Council will make a nominal charge only for the land, and take down the existing boundary wall and erect railings in its place, subject to the Vestries agreeing to pay the cost of the alterations and to make up the road and footpath to a total width of 33 ft., to maintain the same, and to acquire and add to the road the portion of the forecourt of St. Joseph's Retreat as shown on the plan submitted to the Committee."

The opposition to the project was based on the objection to surrender even a small strip of park land for a street improvement.

Precautions against Cholera. — The Public Health Committee reported that they had been in communication with the Medical Officers of Health of the various sanitary districts within the County of London with respect to the hospital accommodation that would be available in their districts in the event of prevalence of Cholera in London during the present year, and they had been asked whether certain vacant land belonging to the Council in London would be available for temporary hospital purposes. As they considered it desirable that the Council should render any assistance possible in case of a cholera epidemic, they recommended—

"That, subject to the particular sites being approved by the proper Committees, the Council do approve of facilities being given in case of necessity for the erection of temporary cholera hospitals on land in its possession."

This was agreed to without discussion.

Rates of Wages and Hours of Labour.—There appeared on the *agenda* (not for the first time), the following Report of the Special Committee on the Fair Wages' Clause in Contracts:—

"We have further considered the proposed Standing Order for securing trades union rates of wages and hours of labour under contracts for the supply of raw material or manufactured articles, referred back to us by the Council on December 16 last. In view of the conditions as to order and delivery embodied in most of the Council's contracts for the supply of stores, it might not be practicable to make the proposed standing order operative with regard to all such contracts, especially in cases where goods to be supplied might be required, as is frequently the case, to be delivered in small quantities and at different places. We have accordingly endeavoured to modify the proposed standing order in the direction of making the conditions of its application more elastic, while keeping in mind the desire of the Council, as indicated by the terms of our reference, that the payment of recognised trades union rates of wages and the observance of trades union hours of labour should be as far as practicable required from all the Council's contractors. If this standing order be adopted, it will be necessary to amend Standing Order No. 1 by adding to it words providing for the compilation of a list of wages and hours of labour to be observed by contractors for the supply of raw materials and manufactured articles. With these considerations in view, we recommend—

'(1.) That the following be No. 4 of the Council's Standing Orders with regard to rates of wages and hours of labour, viz.:—

In all contracts for the supply of raw material or manufactured articles, other than general contracts for the supply of stores to be used in maintenance, a condition shall, whenever practicable, be inserted that, with respect to all materials or articles produced or manufactured or supplied by the contractor, the contractor will in the production or manufacture or supply thereof (as the case may be) pay and observe the following rates of wages and hours of labour, viz.:—

(*a*) Where the production or manufacture or supply thereof is carried on within twenty miles of Charing-cross, the rates of wages and hours of labour appearing in the Council's list.

(*b*) Where the production or manufacture or supply thereof is carried on at a greater distance than twenty miles from Charing-cross, the rates of wages and hours of labour recognised and in practice obtained by the trade unions of the district where it is carried on.

But any committee shall have power to insert the said clause in any contract for stores when the conditions of purchase will allow it.'

(2.) That, for the purpose of carrying into effect the above Standing Order, the following words be added to Standing Order No. 1, 'and by contractors in respect of the supply, manufacture, and production of any raw material or manufactured articles, except contractors for the supply of stores to be used in maintenance.'"

The consideration of these recommendations was adjourned.

Limit of Height of Buildings.—The consideration of the Special Report of the Building Act Committee on this subject, printed by us a fortnight ago (p. 326, *ante*), was again postponed.

Whitsuntide Holidays.—On the motion of Dr. Collins it was unanimously resolved.

"That the Council at its rising on Tuesday, May 16, do stand adjourned until Tuesday, June 6, and that there be no meetings of Committees after the day of adjournment until Wednesday, May 31, unless in a case of urgency which will not admit of delay."

After transacting other business, the Council adjourned at half-past seven.

MAGAZINES AND REVIEWS.

THE *Gazette des Beaux Arts* contains an interesting article by M. Marcel Reymond on "Florentine Sculpture on the Duomo." M. Jules Guiffrey concludes his article on "Clodion and his Work." M. L. Falize contributes an article on the "Renaissance des emaux peints," dealing however rather with old types than new work; and there is a short review of an English work on Reynolds's notes of his Italian tour, under the title "Reynolds en Italie."

In the *Art Journal* Mr. Walter Armstrong continues his criticism of pictures in the Tate collection. The Meissonier Exhibition is treated by Mr. G. Berne-Bellecour, with illustrations from some of Meissonier's studies, and Mr. Lewis F. Day gives a description, under the title "A Kensington Interior," of the beautiful house of Mr. Ionides. Among the illustrations to this article is shown an effective arrangement of Tanagra figurines on an overmantel of miniature Greek architecture. "A Note on Modern Indian Pottery," by Mr. G. F. Strange, is illustrated with some very characteristic examples.

The *Magazine of Art* contains an article on the Academy Exhibition, with some most interesting reproductions of studies by Sir F. Leighton for "Rizpah." "British Etching" is the subject of an article by Mr. Wedmore, and there is a very interesting one on "The Art of Khuenaten," by Mr. Flinders Petrie. We have also Part I. of a special publication of "Royal Academy Pictures," as a supplement to the *Magazine of Art*.

The *Studio*, a new art magazine, of which the April, not the May number, has been forwarded to us, seems to be devoted to novelties in art a good deal, and contains an article on "A New Illustrator," Mr. Aubrey Beardsley, some of whose work we noticed in the New English Art Club's Exhibition, and who unquestionably is a book-illustrator of very original power, though in an eccentric fashion. An article on "Bookplates" gives some interesting illustrations. The articles in the *Studio* are mostly short, and of considerably varied interest, and by writers who have something to say on the subjects of which they treat.

The *Architectural Review* continues a series of articles on "Historic Styles and Modern Architecture," and gives some good geometrical illustrations of the Bargello at Florence, and the façade of the Hôtel Beaugency, Paris. The *Architectural Review* appears to be very French in its leanings, in the style of its illustrations (which are of excellent quality), and also in its curious irregularity of appearance. It professes apparently to come out eight times a year, but it does not seem to matter when.

The *Architectural Record* continues shamelessly to annex Professor's Aitchison's lectures on "Byzantine Art," printed in our columns; a double robbery of him and of ourselves, which however, to the American editorial conscience seems a perfectly natural and even praiseworthy proceeding. The same number contains a good article (not stolen) by a young English architect, Mr. Banister F. Fletcher, on "The Influence of the Early Renaissance on Sculpture."

The *Quarterly Review*, a very good number in a general sense, contains no article of special interest to our readers, in regard to subject, but that on "Literary Discoveries in Egypt" touches on a good many points which are of interest in relation to relics of Egyptian art also.

The *Edinburgh Review* includes a most interesting and picturesquely written article on "Fontainebleau," dealing with the architecture as well as with the personal memories of the palace, and an article on "Mashonaland," in which the writer touches on Mr. Swan's theories in regard to the orientation of the so-called temples, and takes the same view that we did, that these theories in regard to the architectural remains of Mashonaland are fanciful and untenable, or at least based upon nothing worth calling proof. The writer observes that it is convenient for those who have a passion for establishing orientation theories in regard to ancient ruins that "there are always plenty of stars to choose from."

In the *Century* Mrs. Van Rensselaer writes a short article on "The World's Fair," the chief interest of which consists in the illustrations, which are very effective, though somewhat misty in execution. Then we have an article on some of the decorative painting, by Mr. Melchers and Mr. MacEwen, at the same place, with illustrations of some large decorative paintings in lunettes, which look well in engraving. "Personal Impressions of Nicaragua," by Mr. G. Gaul, will be of interest at a time when so much attention is being directed to this region as the possible site of an interoceanic canal.

Scribner's Magazine comes out with a specially designed cover as what is called an "Exhibition Number," in which, strange to say, there is nothing about the exhibition at all, the aim having only been, apparently, to make an unusually varied and readable number. In this sense it may be a success, but from our point of view it is a less valuable number than usual, consisting mainly of stories, the only article on art being one on "An Artist in Japan," by Mr. R. Blum, with very spirited illustrations by the author.

Harper's Magazine, on the contrary, contains a special article on the Chicago Exhibition, under the title "A Dream City," by Miss (or Mrs.) Candace Wheeler, with a number of illustrations of the sculptural decoration of the Exhibition. Judging from this, there seems to be a good deal of highly respectable sculpture, but not of the first order, to be seen at Chicago.

In the *Nineteenth Century* Mr. A. Raymund Dowling, under the heading "A Walk in Alexandria," combines some description of the present city with a sketch of its past history.

In the *Westminster Review* Mr. J. T. Blanchard deals with the eight hours question, which he sums up as impracticable, pointing out that in the State of Massachusetts, where apparently there has been an attempt to regulate hours of labour by law, the law is constantly and deliberately evaded.

The *Gentleman's Magazine* includes an article on "Memories of Old St. Paul's" (more social than architectural) by Mr. W. C. Sydney, and one on "The Rise and Fall of Millbank Prison" by Mr. G. Rayleigh Vicars, who speaks strongly in regard to the utter practical insuitability of the plan of the building for its purpose, especially in regard to the proper overseeing of prisoners.

Longman's Magazine includes an article by Mr. R. H. Scott on "The Study of Weather and of Climate."

The *English Illustrated* contains an article by Mr. Harry Quilter on "The Royal Academy Exhibition, its Making and Makers," with sketches of some of the pictures of this year, and containing some critical remarks on painting, adapted to the art capacity of general readers. His suggestion of a rule for determining whether any work of art were good or indifferent, to see "if you can trace throughout any informing purpose by which the various details of the picture appear to have been governed," is admirable. The same number contains an article on the Imperial Institute by Sir Somers Vine, with various illustrations, and

one on a trip "From Queenstown to Sheerness in a torpedo boat." There is a frontispiece illustration of Sir F. Leighton's Academy picture, "Hit!"

The *Cornhill* contains an article on the Scilly Islands and their inhabitants, which gives some very picturesque impressions of the places and people.

The *Essex Review* continues its notes on "Essex Churches," dealing in this number with All Saints', Purleigh, of which a sketch is given.

In the *Antiquary* the "Researches in Crete," by Professor Halbherr, are continued; other articles are on "Richborough," by Mr. A. Hall; "Inventories of Church Goods made *temp.* Edward VI.," by Mr. W. Page; "Holy Wells of Scotland," by Mr. R. T. Hope, &c.

Correspondence.

To the Editor of THE BUILDER.

NEW CHRIST'S HOSPITAL.

SIR,—I have seen with great interest the paper on "Hygiene and its Application to the Arrangement of Buildings," read by Mr. P. Gordon Smith, the Architect to the Local Government Board, before the Architectural Association, and published in your issue of 6th inst.

As the result of extended experience in various classes of buildings, the paper in question appears to me to be a most valuable contribution to our knowledge of the hygienic conditions arising from the aggregation and segregation of the dwellers or occupiers of such buildings.

One of the highest medical authorities, quoted by Mr. Gordon Smith, has stated in no uncertain terms that "there is danger in the collection beneath one roof of a number of persons exceeding those of an ordinary family," and other medical men, also quoted by the author of the paper above referred to, aver that aggregation of large numbers in schools tends to spread ophthalmia, diphtheria and allied throat affections, and the truth of these statements is fully borne out by the facts mentioned by Mr. Gordon Smith.

Hence it follows that it is of immense importance to apply most fully the principles enunciated in the paper referred to in designing schools—where large numbers of children are assembled together daily for so many consecutive hours—and it is interesting to inquire how far these principles are to be carried out in the instructions to architects for the New Christ's Hospital. In this instance there does not appear to be any limit as to the cost of the buildings, and the school is evidently intended to be a model one.

How, then, is it proposed to provide residential accommodation? This is to be in fourteen houses of fifty boys in each. Now, although it is very satisfactory to find that the corridor plan with a range of dormitories on either side is not to be adopted, and that a distinct step in the right direction has been made, yet it is to be regretted that so large a number as fifty should have been fixed on for each house when it is found there are several pauper schools with less than thirty in each house or cottage, and in Dr. Barnardo's village homes there are only ten to twelve in each, but it is to be more regretted that the competing architects should be asked to send in an alternative plan "for a block of three houses arranged on the flat system of fifty each." This practically means a block to contain 150 boys—an alternative which, it is to be hoped, will not be adopted. That such an aggregation would have a serious effect on the health of the boys anyone who has followed Mr. Gordon Smith through his paper cannot fail to conclude.

With regard to the educational part of the proposed school buildings at Horsham, thirty class-rooms are required; no mention is, however, made in the instructions as to whether these may be arranged one above the other in buildings of two or three stories high, but there is mention of a drawing class-room which "may be on the top-floor," and in the absence of any restriction as to height or number of stories it may be inferred that more than one storey is anticipated. With so large a site as that of the proposed buildings one would have expected that it would have been stipulated as a matter of importance that the class-room blocks should not be more than one storey in height; it would doubtless improve the hygienic conditions if connecting corridors were dispensed with and the class-rooms entirely isolated and at some distance apart.

It is now generally conceded that what is requisite in a hospital building to secure the recovery of patients is equally necessary in the school, the habitation, and the factory, to maintain the inmates in health. Whilst, therefore, one must regret that hygienic conditions have not been more fully recognised in the preparation of the instructions to architects for the Christ's Hospital competition—yet it is a great encouragement to those who have progress in accordance with the laws of hygiene at heart to find that the end-to-end corridor is not to be adopted.

VIATOR.

"*SUSAN AND ROBERT* TO THE RESCUE."

SIR,—If, before criticising, your art critic would only go and inquire how a lifeboat is launched, he will find that the helpers pull up the beach on the launching rope, which, as it passes through a sheave on the opposite end of the carriage, launches the lifeboat out to sea. The wreck from which I painted was really a little closer in, and yet no attempt was made to sling the people ashore. I would not have painted a subject of this sort without taking pains to make the details correct.

W. L. WYLLIE.

*** As to the matter of the lifeboat, we ought to have said more clearly what we meant, which was that we had no doubt Mr. Wyllie was right as to the action, but that we could not make it out from the picture, after more than one close examination with that object. We have far too much respect for Mr. Wyllie's thoroughness as a painter of shipping to suppose that he would make a serious blunder. As a matter of fact, the writer of the criticism is much interested in all matters connected with the sea and shipping, but he never happened to see a life-boat launched, and is obliged to Mr. Wyllie for an explanation which will probably be needed by a good many others who look at the picture.—ED.

PLANS OF CARLISLE CATHEDRAL.

SIR,—A note on the plan of Carlisle Cathedral (published with your issue of last week) states that the plan is from an outline plan made by me forty years ago. This is an error. The first plan I made of the cathedral was made in or about the year 1870, and it seems probable that the reference should have been to the plan made by the late Mr. Billings in 1840, which your plan closely follows.

My plan was revised up to last year. It showed the whole of the site, with the remains of the monastic buildings, the full extent of the nave (from a survey made when the west wall was uncovered), and the apse to the east of the north transept laid bare last year.

CHARLES J. FERGUSON.

Carlisle, May 9.

LOW SIDE WINDOWS.

SIR,—Without wishing to needlessly reopen a question that has already been under discussion, *i.e.*, "Low Side Windows," I should like to draw attention to the fact, which has recently come under my notice, that these windows, in many cases, opened into those curious little cells built against the walls of the chancel and inhabited by those solitary fanatics called "Ankers," or in modern terms—anchorites, whose rules and regulations are so vividly put forth in the "Ancren Riwle,"* of the thirteenth century.

In the practically inacessible retreats afforded by the hilly fastnesses of the north and the watery fens of the east, religious solitaries found, if not peace, at least seclusion. In the fertile lowlands this was well-nigh impossible; cultivation claimed the land for other purposes so that other means of solitude had to be found. Permission was obtained from the Bishops of the various dioceses to erect against the walls of the Parish churches small lean-to buildings or cells in which the anchorites could carry out their vow of solitary meditation and conflict with the powers of evil. Ducange goes so far in his Glossary as to lay down the dimensions and method of constructing these curious excrescences. They were built either against the north or south wall of the chancel—preferably for obvious reasons the latter—and were, according to Ducange, to be 12 ft. square with three openings, one into the church for participation in the Mass, a second for light, while through a third the unfortunate occupant was supplied with his daily need. The strictest ankers were *inclusus. i,e.*, "walled in," and it was customary for them to prepare their own graves. Women, as well as men, thus shut themselves away from the world, and it was evidently considered by the Church as a matter of some moment, as a regular service† was composed for the walling-in of an "anker." Yet they were not altogther solitary, these men and women with diseased ideas of religion, for in many cases round their little cells the villagers gathered and discussed the local news, and gossipped of their neighbours' shortcomings. The sanitary state of these wretched dwellings may be imagined, and when the Reformation swept them away, we must feel that it, anyhow here, did a good work. Traces of the cells have been practically obliterated. Being built after the church, their walls would not have been bonded into those of the building they abutted against, and their removal was an easy matter. At Benges church, near Hertford, Mr. J. T. Micklethwaite, F.S.A., discovered the remains of an anker's cell against the north wall of the chancel, with its recesses and sockets for the roof-beams, and published an interesting account of this anker-hold in the *Archæological Journal* Vol. xliv. No doubt many of these low windows were used for confessional purposes, as the late Mr. Mathew Bloxham fairly established, but that they were used for burial purposes, or to enable lepers to attend Divine service, seems to me a somewhat far-fetched idea, unsubstantiated by documentary evidence or oral tradition.

PERCY G. STONE.

* Published by the Camden Society, MDCCCLIII.

† *Vide* Salisbury Manual, and the "Pontifical" of Lacy, Bishop of Exeter, in the first half of the fifteenth century.

The Student's Column.

CHEMISTRY.—XIX.

Smelting of Iron Ores (*continued*).

THE limestone burns to lime, which, as in the case of cements, combines with the clay (silicate of alumina) to form silicate of lime and aluminate of lime, which, being readily fusible, melts and sinks to the lower part of the furnace, while the metallic iron, which is fairly pure when first formed, also gradually sinks to the lower part of the furnace, combining, on its way, with small quantities of carbon, silicon, phosphorus, and sulphur. It is protected from becoming oxidised by the blast of air, by the coating of slag which covers each particle of iron. The molten metal being heavier than the molten slag, sinks through it, and collects in the bottom of the hearth, or "crucible" as it is termed, from which it is periodically tapped and run into sand moulds to form the "pigs" of commerce. The slag which floats on the molten metal flows out at a hole specially provided for it, and when cold forms a hard, glassy substance.

Cast or *Pig* Iron.

Commercial cast or pig iron manufactured in the manner described above always contains more or less carbon, silicon, sulphur, phosphorus, and manganese, and usually many other elements in very small quantities. Although these substances may be regarded as impurities, some of them have a beneficial effect upon the physical properties of the iron. The quantity of carbon, especially, which is present in the iron has a marked effect upon the physical qualities of the metal. Thus, in the three commercial forms of iron, viz., *cast iron*, steel, and *wrought iron*, carbon is present in greatest quantity in cast iron and least quantity in wrought.

Cast iron contains from about 2 to 6 per cent. total carbon.

Steel contains from about 0·15 to 1·8 per cent. total carbon.

Wrought iron contains from about nil to 0·2 per cent. total carbon.

The following table shows some analyses of cast iron, steel, and wrought iron:—

	Cast Iron.			Wro'ght Iron.	Steel.
Authority.	Bloxam.			Thorpe.	Thorpe.
	Grey.	Mottled	White.	Swedish	—
Iron	90·24	89·31	89·86	99·863	99·151
Combined carbon	1·02	1·79	2·46	} ·054	} ·501
Free carbon	2·64	1·11	0·87		
Silicon	3·06	2·17	1·12	0·028	0·106
Sulphur	1·14	1·48	2·52	0·055	0·002
Phosphorus..	0·93	1·17	0·91	traces	0·096
Manganese ..	0·83	1·60	2·72	—	0·144
	99·86	98·63	100·46	100·000	100·000

The *free* carbon is usually present as graphite (see carbon, Paper VIII.). Cast iron is obtained in any desired shape by remelting the bars termed "pigs," and running the molten metal into moulds.

The colour of the freshly-fractured surfaces of the various cast irons depends upon the amount of carbon in them, and the rate at which the iron was cooled. In *white* pig, moreover, the carbon is nearly all present in the combined condition, while in *grey* pig the carbon is mostly present in an uncombined state.

Grey cast iron has a higher fusing point than white pig, is not so strong as the other varieties of cast iron, and is comparatively soft. It melts to a considerably thinner fluid than the other varieties of cast iron, and is therefore used for

sharp, delicate castings that are not required to possess great strength.

White cast iron is very hard and brittle; it fuses at a lower temperature than the grey variety, but it never becomes so fluid, and hence is not used for castings, except those of the roughest kind. White cast iron can be converted into grey cast iron by melting it, and allowing it to cool slowly, and grey cast iron can be converted into a granular white cast iron by melting it and suddenly cooling it. This latter fact is taken advantage of in *chill casting;* for instance, in the moulds for the wheels of railway carriages, cold iron of suitable shape, having a thin coating of loam, is placed along the interior sides in order to rapidly chill the molten metal coming in contact with it. In this way the running surfaces of the wheels are made of hard white iron, while the remaining portion of the wheel is composed of the softer but tougher grey variety.

Wrought Iron.

Wrought iron is the purest commercial form of iron. It is usually prepared from the cast pig-iron by "puddling" it in a reverberatory furnace (Fig 15)

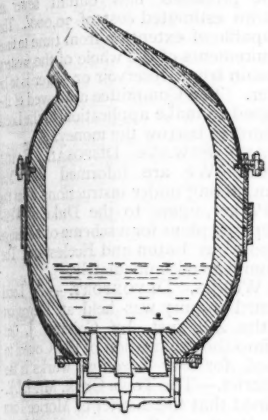


FIG. 16.

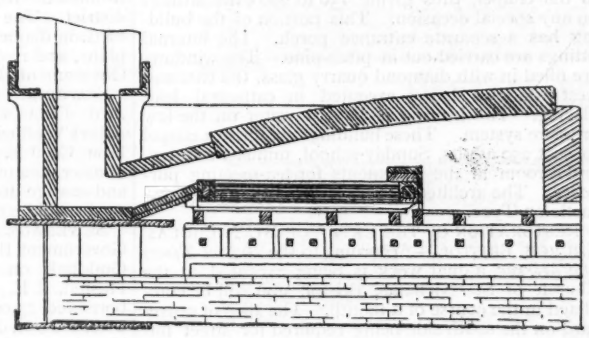


FIG. 15

while in a molten condition. In the furnace, the iron is subjected to a strong *current of air* and the heat of the flame, but it is not brought into contact with any fuel. Previous to being puddled or stirred, the pig-iron is mixed with some oxidising substance, usually a basic silicate of iron, which is termed hammer slag. The carbon in the impure iron then combines with the oxygen in the oxide of iron to form CO, which burns with a blue flame on the surface of the metal, and the silicon also combines with oxygen to form silica, which combines with another portion of oxide of iron to form a fusible slag which is easily separated from the metallic iron. Upon losing its impurities the molten metal becomes less fluid, and by the time its constituent carbon has become reduced to about 1 per cent., the metal will have assumed a pasty consistency. The temperature is then increased and the mass thoroughly stirred, the greater portion of the remaining carbon and phosphorus being removed at this stage. The metal has now become so thick that it can easily be worked into balls, termed *puddle-balls*. These balls, which often weigh ¾ cwt. or more, are placed under a hammer, the blows of which force out the slag and give the metal coherence. Finally, while still red-hot, the metal, which by hammering has become shaped into slabs, is passed between rollers which convert it into *puddled bars*. These puddled bars form the lowest class of wrought iron. The metal thus produced is converted into the better classes of wrought iron by being piled, re-heated in a mill furnace, and re-rolled one or more times. The finest qualities of wrought iron are obtained by refining the pig-iron before subjecting it to the "puddling" process. *Refining* consists in preserving the pig-iron in a molten condition mixed with coke for about two hours with a strong blast of air playing upon its suface. The chemical reactions produced are very similar to those which take place in the "puddling" furnace.

The "Bessemerising" process for producing wrought iron from cast iron consists in oxidising the impurities by blowing fine streams of air through the liquid metal.

The effect of rolling wrought iron is to squeeze out any slag it may contain and to increase its fibrous character. By subjection to constant vibration or concussion, wrought iron loses its fibrous character, sometimes becomes crystalline, and has its tensile strength greatly decreased.

Steel.

Formerly steel was made from wrought iron by surrounding bars of the iron with charcoal and heating them for several days to a bright red heat in a closed furnace. This is known as the *cementation* process, and produces *blister steel*, a name derived from the appearance of the bars, which become blistered through the liberation of CO from their interior. The steel thus produced is not uniform in its composition, but this defect may be remedied by melting the steel and re-casting it.

Bessemer Steel is made from pig-iron. The cast iron is melted and run into a furnace termed a "converter" (Fig. 16), which is a vessed composed of wrought iron and lined inside with fire-brick, fireclay, or "ganister," a powdered sandstone. The whole is hung on trunnions so that it can be tipped by hydraulic power into any position. A blast of air is introduced at the bottom of the converter and blown through the molten metal, causing practically the whole of the carbon to be removed in a very short time. The blast is now stopped, and a charge of from 5 to 10 per cent. of spiegeleisen (an alloy of iron and manganese containing much carbon) is added to the contents of the converter.

Sufficient carbon having thus been added to convert the iron into steel, the product is run off into a ladle and thence into moulds. In order to eliminate the objectionable impurity, phosphorus, from the steel, the Thomas-Gilchrist improvement is adopted. It consists in substituting "basic" lining for the ordinary fireclay lining of the converter. This basic lining consists of bricks made by heating a mixture of ground magnesian limestone and pitch.

By the Bessemer process, six tons of pig-iron can be converted into steel in twenty minutes.

Siemens-Martin process. In this process a quantity of highly heated pig-iron is prepared upon the open hearth of a regenerative gas-furnace, and three or four times its weight of wrought iron or scrap steel melted or dissolved by placing it in the molten pig-iron. When the mixture is completely fluid and has become of uniform composition throughout, samples are drawn from it to ascertain the amount of carbon remaining in the metal, and hæmatite iron ore is added in small quantities until the carbon is reduced to the desired proportion. Finally, siliceous iron, spiegeleisen, or ferromanganese is added and thoroughly mixed into the molten iron in such proportion as will produce steel of the required strength.

Krupp's Cast Steel, which is used for guns, etc., is manufactured by heating spathic iron ore and hæmatite with coke in a puddling furnace. Before being cast the metal is fused in plumbago (carbon) crucibles. Many other processes for producing steel are known, but most of that used in commerce is obtained either by the Bessemer or Siemens-Martin process.

Whitworth's Compressed Steel is obtained by subjecting molten steel to a pressure of from six to twenty tons upon the square inch, the pressure being maintained during the solidification of the metal. Ordinary steel, when first cast, is full of small cavities, which have to be removed by hammering before a first-class steel is obtained, but if the steel is subjected to Whitworth's compression process these cavities are not found.

Puddled Steel is an inferior steel produced by the imperfect refining of pig-iron. It is obtained by treating pig-iron to the process adopted for preparing wrought iron, but the puddling process is stopped when from ·3 to 1·0 per cent. of carbon remains in the iron, instead of removing the whole of the carbon.

Mild Steel differs from hard steel in containing less carbon. Its chemical composition does not differ very largely from wrought iron, but it is greatly superior in many ways to wrought iron, being more ductile and elastic, and possessing a greater tensile strength. It is largely used for boiler plates and shipbuilding, and is also employed for steel rails, and many other purposes. Manganese, which is always present in more or less quantity, increases the tensile strength of steel, but at the same time hardens it and tends to render it less ductile. In common commercial steel the amount of manganese varies usually from ·25 to 1 per cent., and the brittleness of the steel increases until the percentage of manganese is 7½ per cent. Steel containing 7½ per cent. manganese can be reduced, like glass, to a fine powder by striking it with a hammer, but as the amount of manganese is increased beyond this point, the metal becomes less brittle. *Manganese steel*, containing about 14 per cent. of manganese, is a hard and tough alloy, possessing many valuable properties.

Hardening and Tempering of Steel. — If ordinary steel is heated to redness and plunged into cold water while still red hot, the steel becomes extremely hard. As, however, this process renders the steel very brittle, it is frequently necessary to *temper* it; a process depending upon the fact that if the steel is *reheated* and allowed to cool slowly it loses its hardness to a certain extent, but at the same time becomes less brittle. The higher the temperature to which the steel is reheated the less will be the brittleness of the tempered steel. As the steel is heated it becomes covered with a film of oxide, which becomes thicker and changes in colour as the temperature increases. Consequently, the colour of the oxide film is an indication of the temperature of the steel. The following table shows the temperatures at which various implements are tempered, and the various colours of the oxide films produced;*—

Temperature.	*Colour.*	*Implements tempered.*
220° C (428° F)	Pale yellow	Surgical instruments, razors, &c.
245° C (473° F)	Straw yellow	Wood cutting tools, dies, &c.
255° C (491° F)	Dark yellow	Chisels, shears, &c.
265° C (509° F)	Brown	Axes, clasp knives, &c.
275° C (527° F)	Purple	Table knives.
295° — 320° C (563° F—608° F)	Blue	Saws, watch springs, sword blades, &c.

GENERAL BUILDING NEWS.

NEW BUILDINGS FOR THE LEEDS CO-OPERATIVE SOCIETY.—On the 6th inst. the memorial-stone of new buildings for the Leeds Co-operative Society was laid in Albion-street, Leeds. The area of the site contains 1,260 square yards, the greater portion of which will be covered by the new buildings, which will have a frontage of 80 ft. to Albion-street. The basement floor, having an area of about 900 yards, will be mostly used for furniture store-rooms and furniture show-rooms. In addition, room is provided for special ventilation arrangements, and for the electric light, if required. Under the basement is a sub-basement, with boiler-house and air-trunks and receivers. The ground floor will be divided, with a two-thirds frontage to Albion-street for drapery and one-third for furniture. Each department will be approached through the large central entrance. A parcel room, storeroom, &c., are also provided, and special provision is made for the loading and unloading of goods. The first floor will be divided similarly to the ground-floor, but with rooms for reserve drapery in addition. The second floor will contain rooms for fur goods, &c, and a part will be occupied by the educational department of the society. The third-floor will be devoted to work-rooms and stock-rooms. The elevation to Albion-street will be of stone, from the Halifax district, and the elevation to Upper Mill-hill of pressed brick, while white glazed bricks are used for the other elevations. The rooms are lofty and carried on iron columns, with English steel and iron beams and girders. As far as practicable, each floor will be fireproof, with iron and concrete construction, and finished with wood block flooring on the top and cement-panelled ceilings on the underside. The goods will be delivered from each floor by a hydraulic hoist, supplied by Messrs. Tannett, Walker, & Co., of Leeds. The ventilation and warming will be carried out by Mr. Edwin Oldroyd, of Leeds. For the purpose a special sub-basement floor is provided for the warm air, to be carried to the various rooms in the thickness of the walls, and also for the mechanical arrangement to draw and force the foul air out of the building. The contractors are, for the brick and stone work, Mr. C. Myers, Leeds; iron roofs, girders, and columns, Messrs. Bagshaw & Sons, Batley; concrete fireproof flooring, Messrs. A. & P. Wheater; plasterers' work, Mr. Thomas Moore; and the slaters' work, Messrs. Worsnop & Co., all

* Prof. Lewes' "Service Chemistry."

of Leeds. The society will carry out the carpenter and joiner work, the plumber and glaziers' work and painting, providing their own workpeople, who will be under the management of Mr. Philemon Rump, the building manager and clerk of works. The plans and designs have been prepared and carried out under the supervision of the architect, Mr. W. S. Braithwaite, Leeds.

CATHOLIC CHURCH, HANDSWORTH, BIRMINGHAM.—On the 8th inst. the Bishop of Birmingham laid the foundation-stone of a new Catholic Church in the name of the Blessed Trinity and in honour of St. Francis, on land at the junction of Hunter's-lane and Wretham-road, Handsworth. According to the *Birmingham Gazette*, the Rev. A. C. Scoles, of Yeovil, who was by profession an architect before admission into orders, and who has designed several buildings for the Church, drew the plans for the present edifice. It is of Early English type, and will be built of brick and stone. All the stonework outside the building, the dressings, doorways, and windows, will be in Hollington stone, and the interior dressings Bath stone. The nave and aisles will be 90 ft. long, the width of the nave being 25 ft. and the aisles 11 ft. There will be four sacristies and a Lady Chapel. The sanctuary has a measurement of 30 ft. by 25, and will be in three levels, the uppermost for the officiating priest and deacons, the second for the choir, and the third for communicants. The east window is a treble lancet, high up, so as to allow of a high reredos under it. Over the sacristy will be the organ-loft, with large openings into the sanctuary. The west window will be a double lancet, surmounted by a small sun window. At the top of the building will be a statue of St. Francis of Assisi. Entrance will be gained by a main Gothic portal opening upon a porch that will extend the whole breadth of the building. There will be small doors on either side, one for use when the main entrance is closed, the other for processional and other purposes. The seating accommodation will be for 600 persons. The building contract has been given to Messrs. Harley & Son, of Smethwick. The estimated cost of the church is 4,000*l.*

RESTORATION OF THE PARISH CHURCH AT LLANGYNWYD, GLAMORGANSHIRE.—On the 3rd inst., says the *Western Mail*, the ancient parish church at Llangynwyd, after undergoing renovation at the expense of Miss Olive Talbot, London, was reopened by the Lord Bishop of Llandaff. The principal entrance to the church is through the south porch. This has been arched by massive blocks of Quarella stone (Bridgend). Around the principal entrance are pateras of shields and monograms of the Talbot family and arms of the diocese. In the canopy is the figure of St. Cynwyd, from whom the church and the parish derive their names. The western tower, 69 ft. high, has been restored, and is ornamented by four pinnacles with carved crockets. The six bells in the tower have been rehung, and a new framing constructed. Light iron screens separate the belfry from the church. The aisles have been boarded and have seats of solid oak, and the nave contains a heating apparatus. The pulpit is of solid oak, carved with emblems of Faith, Hope, and Charity. The chancel is paved with tesselated tiles. The reredos, which is of oak from the rood-loft of the old church, is divided into panels, and when completed the panels will contain paintings of different sacred subjects. In the chancel is a monument raised by public subscription over the grave of the Maid of Cefn Ydfa. The piscina, which was found a mere fragment, has been placed on a column and base in the south aisle of the chancel, just as it originally stood. The roofs are of solid oak. The east end window has cost about 300*l.*, and is the gift of Mrs. Jenkins, Gelly. The west window has been placed by the parishioners in remembrance of the generosity of Miss Olive Talbot. The architect was Mr. G. E. Halliday, and the contractor, Mr. W. Clarke, of Llandaff.

CHURCH HALL, FAIRFIELD, LANCASHIRE.—The memorial stone of the new church hall in connexion with St. John the Divine, Fairfield, was laid on the 4th inst. The total cost of the site, building, and furnishing will be about 2,500*l.* The architect is Mr. Charles E. Deacon, and the contractors are Messrs. Raffle & Campbell.

NEW BUILDINGS, CAMBRIDGE SANATORIUM.—At the invitation of the Chairman of the Cambridge Sanatorium Committee (Councillor T. Hyde Hills), many members of the Cambridge Town Council assembled at the Sanatorium, Mill-road, Romsey Town, on the 3rd inst., to inspect the wards and the new administrative buildings. The unoccupied wards were first visited, and the plan on which they are built was explained by Dr. Anningson, the Medical Officer of Health. Each of the wards accommodates eight beds and two cots. From the nurses' rooms a full view of the interior of the wards can be obtained. The new administrative building, has been erected from the Borough Surveyor's plans by Messrs. Coulson & Lofts, for the sum of 1,368*l.* It has three entrances, and consists of a dining-room, bedrooms for matron, four nurses and servants, matron's sitting-room, bath-room, kitchen, scullery, larder, pantry, store-room, coal-places, and wood-store. The corridor which runs through the building is lighted by a lantern in the centre. The building is built with white bricks, and the walls are distempered terra-cotta. The whole of the painting inside is varnished. The mantelpieces are built with iron and stone, hot and cold water are laid on in several of the rooms, and the whole building is lighted with gas. The foundation of the building is in cement.

PROPOSED PUBLIC HALL FOR WITHAM, ESSEX.—According to the *Essex County Chronicle*, Mr. E. J. Dampier, architect, of Colchester, acting upon instructions from the directors of the Public Hall Company, Witham, has prepared plans for a proposed hall to be erected on a site in the Collingwood-road, to the north of the water-tower. The size of the hall will be 60 ft. by 40 ft. In front there will be a verandah with a balcony. On either side of the main entrance there will be a cloakroom and a ticket office, over which a gallery will be built to accommodate 130 people. The floor of the hall will seat 470. At the back it is proposed to build a committee-room 38 ft. by 20 ft., and this will be used for small meetings. There will also be dressing-rooms and lavatories, and a kitchen with a copper, &c. Space is reserved on the site for the erection of other buildings at any time.

WESLEYAN CHAPEL AND SCHOOLS, WEST AUCKLAND, DURHAM.—New Wesleyan Chapel and Schools have just been erected at West Auckland. The new buildings are constructed of stone. On the north side there is a transept divided from the chapel by means of Stone's patent swivel partition, whereby the whole of the school can be added to the chapel, thus giving 150 to 200 extra sittings on any special occasion. This portion of the building has a separate entrance porch. The internal fittings are carried out in pitch-pine. The windows are filled in with diamond quarry glass, the east and west windows being executed in cathedral lead glazing. The heating is by hot water on the low pressure system. These buildings comprise a chapel to seat 250 adults, Sunday-school, minister's vestry, and a room in the basements for tea-meeting purposes. The architect is Mr. J. W. Taylor, of Newcastle-on-Tyne.

RESTORATION OF THE CRYPT OF ST. NICHOLAS' CHURCH, BRISTOL.—According to the *Bristol Times and Mirror*, a dual work is being executed at the Church of St. Nicholas, Bristol, and will be completed in the course of a month. The slice of graveyard on the south side being required for street improvement, the vicar and churchwardens embraced the opportunity of the acquisition of the space by the city to have the crypt of the church renovated. The work is being carried out by Mr. Humphries, under the superintendence of Mr. Saunders. The graveyard has been lowered 8 ft., and cut back to within 3 ft. 9 in. of the church. A stone porch has been erected over the entrance to the crypt, and a dwarf wall, with ornamental iron railings, is constructed on each side. The soil and human remains from the churchyard have been deposited in the crypt, and over them has been put a flooring of concrete and tiles. In the crypt were found several mural and other monuments, which have been restored, and a couple of stone coffins, one bearing date 1311. An ancient fire-engine had also been preserved in the gloomy vault. The groining and bosses of the ancient part of the crypt have been restored, and the spaces between them have been filled in with stucco of a warm tint. The newer portion of the crypt is being converted into a choir vestry, for which purpose the south wall has been pierced and windows inserted. The floor is to be laid with wood blocks, and the apartment will be fitted up for the convenience of those who hereafter use it. A flight of stone steps leads from the chancel to the crypt at the south-east corner. When completed the renovated crypt will be a most interesting feature of one of our old city churches.

TECHNICAL SCHOOL FOR WIDNES.—On Tuesday the Widnes Town Council authorised the expenditure of 10,765*l.* in erecting a technical school, to include the free library, according to the plans of Messr. Woodhouse & Willoughby, architects, of Manchester. The original estimate was 6,000*l.*—*Manchester Guardian*.

SCHOOL BUILDINGS, NEW BRIGHTON, CHESHIRE.—On Monday last the foundation-stone was laid of new infant and boys' schools in Egerton-street, New Brighton, connected with the parish church. The building when completed will accommodate from 120 to 150 children, and the cost of erection will amount to 700*l.* Mr. C. F. Allender, Liverpool, is the architect, and Mr. W. Paterson, Liverpool, is the builder.

SANITARY AND ENGINEERING NEWS.

SEWERAGE, WEYBRIDGE AND OATLANDS.—The Chertsey Rural Sanitary Authority, at their meeting on April 25, accepted the following tenders for the sewerage and sewage disposal works for Weybridge and Oatlands:—Mr. John Jackson, The Laurels, Broadway, Plaistow, London, E., for the general contract for the construction of sewers, pumping-station, and precipitation tanks (26,500*l.*); The Stanton Ironworks Co., Ltd., near Nottingham, for the supply of iron pipes, special castings, and other ironwork in connexion with the above works (6,710*l.* 11s. 8d.); Messrs. Davey, Paxman & Co., Colchester, for the boilers and pumping-engines (2,900*l.*); Messrs. Manlove, Alliott & Co., Ltd., Nottingham, for the mixing and pressing machinery at the disposal works (1,514*l.* 2s.). The total amount of the contracts is therefore 37,624*l.* 13s. 8d. There are thirteen and a half miles of earthenware sewers, one and a half miles of iron pipe sewers, and five and three-quarter miles of iron pumping main and pipes conveying flushing water. The whole of the sewage will gravitate to one pumping-station on the banks of the Thames, and the sewage will be pumped a distance of about three miles, to a site of twenty-eight-and-a-half acres, where it will be purified by precipitation in tanks, followed by land filtration. The sewage mud will be pressed. The scheme includes pumping 30,000 gallons of water a day, and distributing it to automatic flushing chambers at the heads of all the sewers. The district is immediately above the London Water Companies' intakes, and therefore the most modern system of sewage disposal was required. Hassall's pipes will be used in some waterlogged streets; and iron pipes in others. The works are ordered to proceed immediately. Mr. W. H. Radford, of Nottingham, is the engineer to the works.

PROPOSED NEW OUTFALL SEWER, GRANGETOWN, CARDIFF.—A meeting of the Cardiff Public Works Committee was held on the 27th ult. at the Town Hall, Cardiff. Mr. Harpur, the Borough Engineer, submitted complete plans, drawings, and estimates of the proposed new outfall sewer at Grangetown at an estimated cost of 70,000*l.* The sewer will be capable of extension from time to time to meet the requirements of the whole of the western district. The main trunk reservoir or sewer is to be 12 ft. in diameter. The Committee approved of the plans, and resolved to make application to the Local Government Board to borrow the money.

SEWERAGE AND SEWAGE DISPOSAL, EATON AND ECCLESTON.—We are informed that Mr. Albert Wollheim, acting under instructions from the Hon. Cecil T. Parker, agent to the Duke of Westminster, has prepared plans for a scheme of sewerage and sewage disposal at Eaton and Eccleston. The works will be commenced immediately.

SEWERAGE WORKS, DEVONPORT.—A Local Government Board inquiry was held at Devonport Guildhall on the 4th inst. by Colonel J. Ord Hasted, R.E., into the application of the Council to borrowed 23,000*l.* for new sewerage works in the Morice Town district.—The Town Clerk, Mr. J. J. E. Venning, explained that the district of Morice Town was thickly populated, and there was not much land available for new buildings. The houses, chiefly occupied by the artisan class, had been drained hitherto by cross-drains, connected with very imperfect sewers, constructed many years ago. Within the last twenty years considerable additions had been made to the buildings in the district, and it had become absolutely necessary to provide properly constructed sewers. In laying down a new system of sewers, it would be necessary to rectify the system of house drainage. There were two outfalls. The chief one was by means of a large iron pipe at the southern end of Keyham-yard, and carried out into deep water. One part of the sewer discharged at the head of Moon Cove. It was proposed to bring the drainage of the new district into that outfall. Another outfall at present discharged into Hamoaze, near Pottery Quay, and it was proposed to extend it 40 ft. into deep water.—The Borough Surveyor, Mr. J. F. Burns, then explained in detail the works it was proposed to carry out. In some cases in Albert-road, after a heavy flood, the sewers had broken away and carried portions of the houses with them. Temporary repairs had been made, but it had now got so bad that nothing short of re-sewering the whole district would answer the purpose. In this district he had very difficult gradients to deal with. The old drains would be filled up with the rubble excavated for the new sewers.—The Inspector then considered a further application to borrow 950*l.* for the improvement of the eastern entrance to Fore-street.—The inquiry closed with a vote of thanks to the Inspector, on the proposition of the Mayor, after which Colonel Hasted visited the districts proposed to be dealt with.

STAINED GLASS AND DECORATION.

WINDOWS, ARMYN CHURCH, GOOLE.—Stained glass has been inserted into the two chancel windows of Armyn Church, Goole, in memory of the late Mrs. Wells, of Booth Ferry House. The windows are the gift of her children. The parishioners and friends have also filled one of the nave windows with stained glass illustrating the Resurrection, and Our Lord's Charge to St. Peter. The work has been carried out by Messrs. Powell Brothers, of Leeds.

MEMORIAL WINDOW, TROSSACHS PARISH CHURCH.—A large three-light window, occupying the east end of Trossachs Parish Church, has just been unveiled. It is placed in the church in memory of the late Mr. Alexander Dunsmuir, Glenbruach, Callander. The subjects selected are three illustrating the good Samaritan, with the figure of Christ occupying the upper portion of the lights. The window is from the studios of Messrs. Ballantine & Gardiner, Edinburgh.

WINDOW, ROBERTSON MEMORIAL CHURCH, EDINBURGH.—A two-light stained glass window has been placed in this church. The subjects selected are two scenes from the life of Timothy. The win-

dow is presented by Mr. A. B. Armitage, treasurer of the church, and occupies a position in the south transept. Messrs. Ballantine & Gardiner, Edinburgh, supplied the window.

FOREIGN AND COLONIAL.

FRANCE.—The Municipal Council of Paris has postponed till December the removal of the artistic treasures of the city to the pavilion on the Champs Elysées, and up to that date the public can again visit the galleries of the Museum of Auteuil, which had been temporarily closed.——The subject in architecture set for the Prix de Rome, is Un Palais de Sociétiés Savantes." The other subjects are, for painting, Samson at the Mill; for sculpture, "The Age of Gold" (period of Hesiod) for medallions, Orpheus charming Cerberus to sleep. —The Académie des Beaux-Arts has classified the candidates for the post left vacant by the death of Cabat in the following order of precedence; MM. Benjamin Constant, Aimé Morot, Roybet, Joseph Blanc, de Curzon, Harpignies, and Maillard. The election is to take place to-day (Saturday). The Académie has elected Mr. A. Waterhouse, R.A., a foreign corresponding member in the section of architecture.—— The Government has just published, in the *Journal Officiel*, the programme of the competition for the rebuilding of the Opéra Comique, and fixed July 9 as the day for sending in designs, which will be exhibited both before and after the award. The author of the design classed first will have three months in which to prepare a final set of plans with an estimate of the cost, which is not to exceed 3,500,000 francs. The ground on which the new building is to stand is a rectangle about fifty-two mètres long and ninety wide.——In August next the new bridge over the Marne at Bonneuil is to be opened.——On July 1 the new railway from Limoges to Brive (*via* Uzerche) will be opened. —— Next month the new Salon of the "Union Libérale des Artistes Français is to be opened" in the Central Dome of the Champ de Mars.——M. Homolle, director of the excavations undertaken at Delphi by the French School at Athens, has telegraphed to the Minister of Public Instruction the discovery of more than one hundred inscriptions.——The official opening of the Port of Tunis is fixed for May 28.——An art exhibition is to be opened at Arras on June 1. —The art exhibition at Auxerre will be open from June 10 to July 10. —The art exhibition at Angoulême, which opened on the 9th, is to close on July 9.

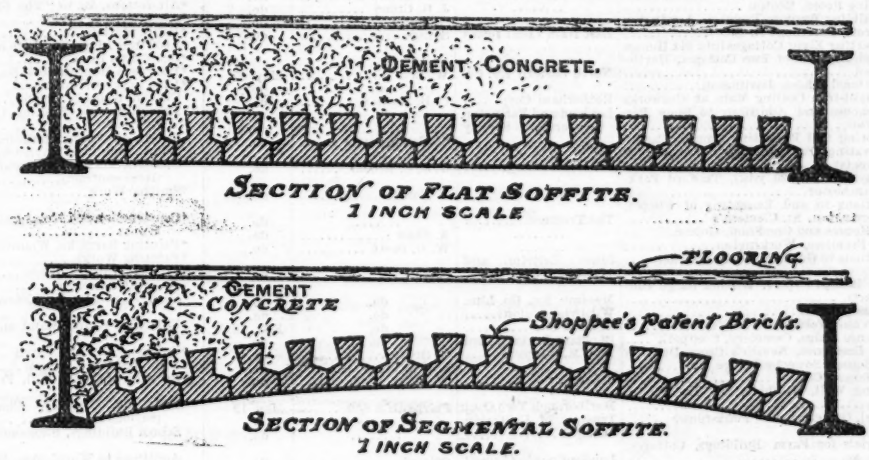
BERLIN.—Owing to the alterations of the high-water level of the river Spree, the terrace at the back of the Royal Castle has had to be rebuilt. The new terrace, which has a length of about 150 mètres, will now be an important architectural feature to the rear facade of the castle. It will show careful architectural treatment, the materials used being granite and bronze. Two landing places have been arranged for the royal flotilla.——Much difficulty is apparently being experienced with the demolitions of the old "Dom." After the several unsuccessful attempts at blowing up the building, the block collapsed from after effects of the shocks, but in such a way that the old materials are so tightly wedged together that it seems nearly impossible to loosen them or break them up by manual labour. The laying of the foundations for the new Cathedral will have to be postponed, and it seems less likely than ever that the Emperor William's commands as to the date of consecration will obeyed. —Owing to structural alterations in the Royal Theatre, the company had to migrate to a private establishment known as the "New Theatre." The public soon noticed that the acting of the company on the smaller stage was far bettter than in the larger one, and the local press is now calling for a new Court Theatre for dramas or comedies with small casts, whilst our technical contemporaries comment on the dimensions of play-houses in general. We hear that the Royal Theatrical Office will probably lease the "New Theatre" for some time before deciding as to building the new play-house asked for. Prior to building a third theatre it would surely be better to rebuild the hideous and dangerous Royal Opera House.——There has been much feeling in Berlin as to the opening of the Royal Museums and Picture Galleries on Sunday afternoons. The Government has now promised to keep these places open as desired, and has this month started with the collections of the National Gallery, which can be visited from noon until 6 p.m. on the day in question.——The International Art Exhibition is to be opened with much ceremony on the 14th inst. We understand that the exhibition will be remarkable for a fine show of monumental sculpture.

MISCELLANEOUS.

THE IMPERIAL INSTITUTE.—The opening of the Imperial Institute by the Queen has been the event of the week in London. We have already on various occasions (notably in our number for June 25, 1892) devoted so much space to the description and illustration of this building that it is not necessary to add anything now. We may mention, however, that the following illustrations of the building have appeared in the *Builder* on the dates named:—Mr. Collcutt's design, as submitted in competition, July 2, 1887; plans and detail of *façade*, July 9, 1887; large perspective view, January 5, 1889; and a large coloured view of the central tower, June 18, 1892.

DE FOE'S COTTAGE, TOOTING. — De Foe's cottage on the Mitcham-road, Tooting, standing in 2½ acres of ground, is to be sold. It is, we believe, the second of the two houses occupied by him when, just before the Revolution, he removed to Tooting. There he formed a congregation of Dissenters, with Joshua Oldfield, D.D., as their first pastor. The chapel was built in 1765-6, and in 1875 the Memorial Manse was erected. A cut of the house, and of some relics from the old meeting house, is given in Mr. William Lee's "Daniel Defoe," Vol. I. (1869). That work, too, contains an interesting account of a visit made by its author, in 1860, to Tilbury, upon the completion of the London, Tilbury and Southend Railway. There he found a deep trench had been cut through a plot of land on the west side of the station. This trench, made to drain the Company's estate and the railway servants' garden plots, had laid open the whole of De Foe's brick and pantile works (1698-1703), showing the drying floors, claypits, kiln foundations, and so on.

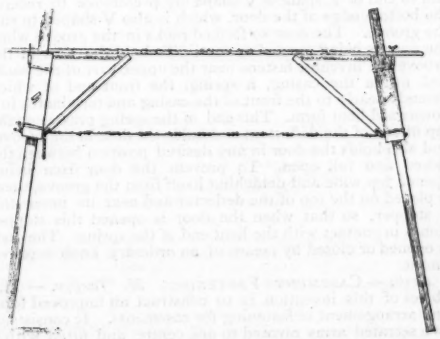
SHOPPEE'S DOVETAILED BRICKS.—These bricks are intended both to lighten the weight of bricks, where it is desired to use brick for the underside of concrete flooring, and give a better bond into the concrete. The bond is of the same value, also if they are used as facing-bricks for vertical walls. The accompanying cuts show their use.



Shoppee's Dove-tailed Bricks.

HOUGHTON'S PATENT WINDOW.—This is one of the innumerable inventions for turning sash windows for cleaning, which has some special merits of its own. It is very simple in its action, does not rob the window opening of any light, or increase the substance of woodwork in the sashes, and the stiles are not weakened by cutting down or jointing. By turning a bolt which works into the sash-frame, the sash can be raised sufficiently to clean the lower beading, and is then swung inward on a pivot. A thin metal strut may be used to support a heavy sash in its place while cleaning; the objection to this, however, is that the strut, which when not used fits into a slit in the frame, must rather spoil the appearance of the frame, as it cannot entirely escape observation. Instead of this, however, a hook and suspending cord may be used, which can be applied to each window in turn. The arrangement can be applied, without much trouble or cost to existing sashes.

AYLING'S PORTABLE SCAFFOLD. — This is to take the place of the high trestles often used by painters, with a loose board put across them. It consists of four round legs and two frames, which slide up and down the legs, and can be fixed at any point by means of set screws on the outsides of the frames. The planks are fixed to the frames, and



the whole thing is safe. It can be used on a staircase or on ground which is not level, as each of the legs can be raised or lowered separately. As we not long since saw a bad accident from the fall of a board from two of the ordinary high trestles, by which an unfortunate painter came down on the pavement and broke his thigh, we have been practically impressed with the necessity for some such improvement, and we recommend it to the notice of builders and others who are in the habit of using the ordinary loose trestles.

CAPITAL AND LABOUR.

THE CARDIFF BUILDING STRIKE.—The announcement, says the *Western Mail*, that the Cardiff building strike has been finally disposed of is, unfortunately, only partially true. The masons, it is true, have declared the strike at an end. The Master Builders' Association, however, will not concede the old rules, and in their last ultimatum specified that they would not agree to the retention of the note prohibiting piecework and sub-contracting, and that the rule relating to the importation of worked stone should read—"That no worked stone be brought into the town for the purpose of being used on contract work, excepting landers, steps, plain and chamfered coping, and Yorkshire paving; also granite and marble," instead of the old one—"That no worked stone be brought into the town, excepting landers, square steps, and Yorkshire paving." The advance in wages of ½d. per hour was mutually agreed upon some time ago, there being ½d. extra for fixers.

MEETINGS.

FRIDAY, MAY 12.

Architectural Association.—Mr. E. Guy Dawber on "The Stone Buildings of the Cotswolds." 7.30 p.m.

SATURDAY, MAY 13.

St. Paul's Ecclesiological Society.—Visit to the Church of St. Bartholomew the Great, Smithfield. 3 30 p.m.

MONDAY, MAY 15.

Royal Institute of British Architects. — Professor G. Baldwin Brown, M.A., on "How to use Vitruvius." 8 p.m.

Society of Arts (Cantor Lectures).—Mr. C. Harrison Townsend on "Mosaic: its History and Practice." II. 8 p.m.

TUESDAY, MAY 16.

Institution of Civil Engineers.—Mr. C. J. More on "Wreck-Raising in the River Thames." 8 p.m.

Royal Statistical Society.—Mr. H. Higgs on "Workmen's Budgets." 7.45 p.m.

WEDNESDAY, MAY 17.

Architectural Association.—Members' *Soirée*, to be held at the Westminster Town Hall. 7.45 p.m.

Carpenters' Company, Carpenters' Hall (Lectures on Carpentry and Joinery).—Mr. Thomas Blashill on "Doors, Windows, and Ornamental Joinery." 8 p.m.

British Archæological Association.—Mr. E. P. Loftus Brock, F.S.A., on "The Excavation of the Site of Winchcombe Abbey." 8 p.m.

Society of Arts.—Mr. F. E. Ives on "Composite Heliochromy." 8 p.m.

Royal Meteorological Society.—Three papers to be read. 7 p.m.

Society of Biblical Archæology.—4.30 p.m.

THURSDAY, MAY 18.

Society of Antiquaries.—8.30 p.m.

SATURDAY, MAY 20.

Incorporated Association of Municipal and County Engineers.—Midland Counties District Meeting, to be held at the New Waterworks of the Long Eaton Local Board, Stanton-by-Bridge, near Derby.

Glasgow Architectural Association.—Visit to Hawkhead Asylum.

RECENT PATENTS.

ABSTRACTS OF SPECIFICATIONS.

11,593.—WALL VENTILATORS: *E. Ballard.*—This improved wall ventilator is composed of two sections of galvanised iron tube. The end of the lower one is perforated, and the upper one has a damper, and on the top is firmly arranged a portable wooden shelf, also perforated. This is draped with passementerie or leather, so as to conceal the upper section, which is inside the room, and it is studded with brass or gilt studs. The latter is firmly secured to the wall by slight ironwork, the lower section being laid in the brickwork with cement. This invention is particularly applicable for ball or public rooms, also dining, drawing, bedrooms, stair-cases, or over doors.

1,734.—PARQUET FLOORING: *H. Sichelschundt.*—The object of this invention is to construct the tesseræ from sheet metal, or a similar rigid material, so that they shall

COMPETITION, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITION.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered.
*New Municipal Buildings	Darlington Corp.	.....	No date

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Stables, Car Sheds, &c. Dalhousie-street	Glasgow Corp.	*Official*	May 15
Granite Road Metal (2,000 tons)	Bedford U.S.A.	do.	May 16
Lengthening Bridge, Walls, &c. Gilfachgoch-road	Pontypridd High. Bd.	do.	do.
Cottage, &c.	Normanton Local Bd.	do.	do.
Kerbing, Channelling, &c. (two streets)	Rotherham Corp.	do.	do.
Vicarage, Harehills, Leeds	.....	Ambler & Bowman	do.
Engine House, Engine Bed, &c. Beckside Mills, Great Horton	.....	J. Drake	do.
Additions, &c. to Houses, and Erection of Five Houses and Shop, Doncaster	.....	Burtonshaw & Tovey	do.
Reading Room, Benton	.....	J. G. Crone	do.
Re-building Business Premises, Accrington	.....	H. Ros	do.
*Concrete Pavement in Situ	East Ham Local Board	Savage	do.
Converting Eight Cottages into Six Houses and Erection of Two Cottages, Hartlepool	North Eastern Ry. Co.	W. Bell	May 17
Additional Offices, Darlington	do.	do	do
Wrought-iron Coaling Main at Gasworks	Rotherham Corp.	C. B. Newton	do.
Warehouse and Additions to Shop Premises	Leyland and Farington Co-operative Society	.....	do.
Restoring and Re-seating Church, Cardiff	.....	Seddon & Carter	do.
Excavating, Paving, Flagging, &c. (eleven streets)	St. Helen's Corp.	G. J. C. Broom	do.
Brick Sewer (1,430 yds.), Trafford Park, Manchester	....	J. Bowden	do.
Additions to and Re-seating of Chapel, Terrington, St. Clement's	The Trustees	.....	do.
Two Houses and One Shop, Golcar	.....	A. Shaw	do.
Shop Premises, Workington	.....	W. G. Scott	do.
Additions to Goods Store, Enniskillen	Sligo, Leitrim, and Northern Counties Ry	*Official*	do.
Steel Rails, Sleepers, London (large contract)	Mexican Ry. Co. Lim.	do.	do.
*Guernsey Spalls	Woolwich Union	do.	do.
Stores and Materials	G. E. R. Co.	do.	May 18
Entrance Lodge, Cemetery, Coedpeth	Bersham Burial Board	do.	do.
Villa Residence, Neville's Cross, Durham	Mrs. M. Simpson	G. Ord	do.
Ten Houses, Sowerby Bridge	.....	S. Wilkinson	do.
Warehouse, Cardiff	Cravos Bros.	W. H. D. Caple	do.
Sinking Well, Borehole, and Test Pump, &c.	Marlborough Twn Coun	Fairbank & Son	May 19
Chapel, Graigtrebanos, Pontardawe	Trustees of Unitarian Chapel	.....	do.
*Materials for Farm Buildings, Cottages, &c. &c.	LondonCounty Council	*Official*	do.
Concrete Wall and other Works	Renfrewshire C. C.	Niven & Hadden	May 20
Re-paving, &c. Gerrard-street	Ashton-in-Makenfield Local Board	F. C. Hodgkinson	do.
Cottage, &c. Hetton	T. Lamb	.....	do.
Lime, &c. (ten months)	Eastbourne Twn Coun.	*Official*	do.
Kerbing, Paving, Channelling, &c. (several roads)	do.	do.	do.
Paving Setts, Road Metal, &c.	Walsall Corp.	do.	do.
Reforming, Paving, &c. Main Road	Westhoughton L.B.	do.	do.
Cast Iron Pipes, &c.	Ely Local Board	do.	May 22
Gable Ends to Stores, Foundations, &c. at Gasworks	Bury Corporation	W. H. S. Gendall	do.
School Buildings, Fenton	Stoke-upon-Trent Sch. Board	R. Scrivener & Sons	do.
Additions, &c. to Club House, Wednesbury	.....	E. Pincher	do.
Extension of School Buildings	Cardiff School Board	E. M. Bruce Vaughan	do.
Water Supply Works, Sonning	Wokingham U.R.S.A.	R. W. Hamilton	May 23
Stables, &c.	Southampton Corp.	W. B. G. Bennett	do.
*New Boys' School	Harrow-on-the-Hill School Board	Houston & Houston	do.
Corrugated Iron Railway Hall, Utrecht, Holland	Dutch State Railways	*Official*	do.
Dwelling House, Farm Buildings, &c. Old Meldrum, Aberdeen	.....	J. Duncan	May 24
Market Place, &c.	Pontypool Local Board	R. Williams, & D. J. Longher	do.

CONTRACTS—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Erection of a Church, Llwydcoed, Aberdare	Rev. E. Bevan	.....	
*Waterworks	Exmouth Waterwks Co.	E. Cousins	May 2
Twenty Cottages, Penybont, Mon.	Griffiths Building Club	E. A. Lansdowne	do
Granite Sets (7,000 tons)	Birmingham Corp.	W. S. Till	May 2
Impounding Reservoir, Hurlock	Barrow-in-Furness Corporation	*Official*	do.
New Cemetery Works, Ryecroft	Walsall Corporation	do.	do.
Sewerage Extension and Irrigation Works, Milbourne Port	Wincanton R.S.A.	A. P. V. Cotterell	do.
Reservoir, and other Water Supply Works	Tredegar Local Board	T. Rees	May 2
Cast Iron Pipes (410 tons)	do.	do.	May 2
*Supply of Materials	Toxteth Park L.B.	J. Price	do.
*Sorting Office, Balham	H.M. Works	*Official*	do.
*Reparation and Cleansing Sewers	Com. of Sewers (City of London)	do.	do.
Road Metal, &c.	Bromborough L.B.	do.	May 2
*Painting, Whitewashing, &c.	St Giles and Bloomsbury Guardians	do.	do.
*Enlargement of N.W. District Post Office	Com. of H. M. Works	do.	do.
*New Infirmary Buildings	Steyning Union	A. Loader	do.
*Stables, &c. Leeds	North Eastern Ry.	W. Bell	do.
*Gates and Railings	Bristol U.S.A.	*Official*	May 2
Sinking Shaft, Clydach Vale	Thomas, Riches, & Co.	.....	do.
*Alterations, &c. to "The Chesnuts"	Essex Lunatic Asylum	*Official*	June 1
*Alterations to Bridge	Hertford High. Com.	Urban A. Smith	June 2
*Police Station	St. Alban's Corp.	*Official*	do.
*5,000 tons Photo-Sulphate of Iron	LondonCounty Council	do.	June 6
*20,000 tons Lime	do.	do.	do.
*1,500 tons Manganate of Soda	do.	do.	do.
*1,700 tons Sulphuric Acid	do.	do.	do.
Church, Nenagh, Ireland	Very Rev. Dr. White	W. G. Doulin	do.
Providing and Sinking Cast-Iron Well Cylinders	Richmond (Surrey) Town Council	W. G. Peirce	do.
Extension of School Buildings, Aberllechan	Llanwonno Sch. Bd.	A. O. Evans	do.
School Buildings, Ynynsbwll	do.	do.	June 7
Construction and Maintenance of Reservoir (large contract)	Bradford Corporation	J. Watson	do.
*Smiths' Work	Com. of Sewers (City of London)	*Official*	June 6
*Construction and Maintenance of Sewerage Works	City of Cape Town	Clement Dunscombe	June 2
*Painting Barracks, Woolwich	War Department	*Official*	July 2
*Painting Works	do.	do.	No date
*Citadel, Hunslet, Leeds	Salvation Army	A. Gordon	do.
Hospital, Leicester	Blaby U.R.S.A.	W. H. Simpson	do.
Shop, House, &c. Heckleton, Rotherham	Whitworth, Son, and Nephew	H. L. Tacon	do.
Enlarging Grand Stand and other Works	Ashton-under-Lyne Agricultural Society	.....	do.
*Enlarging Christ Church	New Malden Com.	H. A. Cheers	do.
Villa Residence, Wigan	.....	W. E. V. Crompton	do.
Erection of Cotton Mill, Preston	Horrockses, Crewdson, & Co.	Potts, Son, & Pickup	do.
Metalling, Paving, Channelling, &c. (various streets)	Rushden Local Board	W. Pare	do.
School Buildings, Shoscombe, Bath	Wellow and Shoscombe National Sch. Mangr.	J. A. Benyon	do.
Additions to Workhouse, &c.	Northallerton Union	James Garry	do.
Hall, Dalkeith	.....	J. B. Dunn	do.
Re-building St. Peter's Church, Lurgan	Rev. J. O'Hare	J. J. M'Donnell	do.
Erection of a Church, Long Hanborough	.....	G. L. Barker	do.
Three Cottages, Eastwood, Rotherham	Mr. Willis	.....	do.
Additions and Alterations to Post Office, Ynyshir, Pontypridd	T. Jones	.....	do.
Chapel, Burnley	Trustees of Primitive Methodist Chapel	G. E. Bolshaw	do.
School Buildings, Notts	Greasley School Board	S. Taylor	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.
Surveyor (Hoole)	Chester U.R.S.A.	.....	May 16
Water Engineer and Surveyor	East Stonehouse L.B.	150*l.* per annum	May 16
*Clerk of Works	Boro of Ipswich	3*l.*	May 22
*Road Foremen (Two)	Maidstone U.S.A.	2*l.* per week each	May 26

Those marked with an Asterisk (*) are advertised in this number. *Contracts pp.* iv., vi., viii, *and* xxii. *Public Appointments, p.* xx.

be mutually engaged and held in place without screws or rivets. The edges of the tesseræ are turned alternately up and down, that is to say, two of the parallel sides or edges are turned up, and the other two are turned down.

3,158.—TROLLEY FOR SANITARY PIPES: *H. Coulthurst and others.*—This patent refers to an improved trolley or carriage for the conveyance of earthenware sanitary pipes from one place to another after they have been moulded or formed, and before being burnt. The pipes in this state are each placed on end, socket upwards, on a board provided with battens at the back, and the improved trolley is specially constructed to receive and convey these boards, together with the unburnt pipes, without injury to the latter.

3,860.—CLOSETS: *A. J. Boult.*—This invention relates to that class of closet in which the cover of the seat is used for effecting the closure. This object cannot generally be obtained by simply fitting the cover on the seat, because even with the most careful joiner's work the case of the pan forming the seat is not tightened against the latter, nor is it air-tight. According to this invention the basin is tightened against the seat by a flange, and the cover against the seat. The flange, however, may penetrate the aperture of the seat, so that the cover can be tightened directly against the flange. In both cases the cover is provided on its bottom side with a tightening ring, and is pressed against the seatboard or against the flange by its own weight, or by suitable mechanism. This tightening of the pan to the cover forms the first part of the invention, the second part consisting of a special arrangement of the locking mechanism, which may be so arranged that in locking it no unaccustomed operation will be necessary, as it may be done automatically. The pan is thus covered after each use of the closet.

3,992.—VENTILATORS: *G. Bray.*—This specification describes improvements in patent, No. 5,137 of 1891, granted to the inventor. In the previous specification the inventor did not confine himself to any particular material in the construction of the ventilator, but he has usually made the same of wood It has been found, however, that in such cases, and when placed in new damp walls and during wet weather, the sides of the case and also the door swelled to some extent, and the door became tightened, causing a difficulty in opening and closing. The hinge pins also became rusted. The modification now is that the same should be made of cast metal in one piece, and that the door with the deflectors upon it should be cast also in piece, and and that there should be no hinges. Near the front edge of the bottom of the case of the door is cut a groove from end to end of a shallow V shape by preference to receive the bottom edge of the door, which is also V shaped to suit the groove. The door so formed rocks in the groove when the door is being opened or shut. To hold the door in the groove the inventor fastens near the upper part of the back, and inside the casing, a spring, the front end of which extends nearly to the front of the casing and terminates in a downward bent form. This end of the spring presses on the top of one of the deflectors and holds the door in the groove, and also holds the door in any desired position between the closed and full open. To prevent the door from being opened too wide and detaching itself from the groove, there is placed on the top of the deflector and near its inner end a stopper, so that when the door is opened this stopper comes in contact with the bent end of the spring. The door is opened or closed by means of an ordinary knob screwed into it.

4,116.—CASEMENT FASTENING: *M. Jaeger.*—The object of this invention is to construct an improved form and arrangement of fastening for casements. It consists of two serrated arms pivoted to one centre, and fitted with a coiled or other suitable spring, the power of the spring being applied so as to close the arms together. A pin fixed to the frame of the casement engages in the serrations of the arms, the casement being thereby secured as required.

NEW APPLICATIONS FOR LETTERS PATENT.

APRIL 24.—8,211, J. Riddiough, Construction of Blades or Saws for Sawing or Cutting Stone.—8,212, J. Sellars, Production of Facing Materials for Building and other Surfaces.—8,233, G. Lawrence, Sanitary Closet-pan, and Automatic Soil-pipe and Drain Disconnector.—8,242, T. Gawthorp, Sash Fastenings.

APRIL 25.—R. Holt, Syphon Flushing Cisterns for Water-closets, &c.—8,294, J. Gill and J. Burns, Steam Brick and Tile Press.—8,299, J. Jameson, Fasteners for Windows, Casements, Shutters, &c.—8,302, P. Mooney, Gully-traps and Tops for same.—8,314, J. Luscher, Adjustable Mitre-boxes.—8,345, H. Lake, White Lead.—8,361, G. Restall, Nails.

APRIL 26.—8,379, J. Duckett & Son, Limited, Water-closets.—8,431, G. Székeley, Saw Blades.—8,451, H. Wood and G. Harvey, Kitchen Ranges.

APRIL 27.—8,466, J. Gibson and A. Carlander. Flushing Cisterns for Water-closets, &c.—8,469, J. Kirkman, Cowls for Chimneys, Air-shafts, or of Foul Air Extractors.—8,488, H. Grainger and J. Clark, Road Paving Blocks.—8,489, H. Grainger and J. Clark, Moulds for the Manufacture of Building Blocks.—8,508, C. Knapp, Sash Lift and Lock.—8,518, R. Stone, Fireproof Plastic Material for Cement, &c. 8,524, J. Leigh, Fireproof Floors and Roofs.—8,526, H. Wilcke, Heating Buildings.

APRIL 28.—8,538, T. Gardiner, Glazing.—8,543, A. Phillips, Combination High-pressure Water Fittings.

APRIL 29.—8,643, W. Sykes, Interceptors for Sewers or Drains.—8,659, I. Jones, Sash-fastener.—8,672, M. Harczyk, Tiles for Stoves, &c.—8,680, W. Toone, Ventilation.

PROVISIONAL SPECIFICATIONS ACCEPTED.

678, J. Weil and others, Non-bursting Water-pipe and Unbreakable Gas-pipe.—3,198, F. Stokes and others, Chimney-pot, Cowl, or Ventilator.—5,711, R. Strong and A. Gordon, Artificial Stone.—6,315, R. Froude, Sash-fastener.—6,414, G. Henn, Window-sash-fasteners.—7,095, B. & A. Dicksee, Flushing Water-closets.—7,148, C. Hepworth and R. Robson, Fire-grates.—7,155, D. Keith, Window-sash-frames.—7,425, F. Willis, Fire-proof Floors.—7,447, J. Sellars, Applying Cement, or Analogous, or

other Materials, to Surfaces.—7,499, W. Sykes, Compositions suitable for Paving, Building, Pipe-jointing, &c.

COMPLETE SPECIFICATIONS ACCEPTED.

(Open to Opposition for Two Months.)

8,910, J. Longworth, Closing and Latching Doors.—10,455, J. Gastrell, Fastening Devices for Windows and Doors.—10,532, M. Laffont, Material suitable for Building and Architectural purposes, &c.—11,811, S. Marcus and E. Bothe, Fire-grates.—12,678, J. Whittaker, Machines for Making Compressed Bricks, &c.—12,922, C. Taylor, jun., Planing or Shooting Mitres.—15,003, J. Waddington and J. Pendlebury, Devices or Means for Retaining Windows or Doors in any Desired Position.—314, C. Jackson, Simplex Lever Fanlight-opener.—3,034, A. Dumoulin, Varnishes.—6,246, G. Law, Gully Trap.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

MAY 1.—By *Ramsay & Co.*: 120, Lisson-grove, St. John's Wood; and 23, Grove-st., f., r. 50*l.*, 1,000*l.*—By *J. Tomlinson & Co.*: 1 to 24, Cooke-st., Barking, u.t. 93 yrs., g.r. 66*l.*, 1,925*l.*—By *F. S. Priest*: 212, High-st., Hoxton, u.t. 87 yrs., g.r. 6*l.* 10*l.*, 445*l.*; 2, Villiers-pl., Willesden, u.t. 89 yrs., g.r. 6*l.*, r. 40*l.*, 425*l.*; 78, Hillside, u.t. 8 yrs., g.r. 10*l.*, r. 40*l.*, 350*l.*—By *Randall, Beard, & Baker*: 1, Clifton-gardens, Maida Vale, u.t. 55 yrs., g.r. 13*l.*, r. 102*l.* 10s., 850*l.*; 40, Clifton-gardens, u.t. 56 yrs., g.r. 26*l.*, r. 125*l.*, 1,100*l.*; 28, Hamilton-gardens, u.t. 86 yrs., g.r. 6*l.*, r. 48*l.*, 420*l.*; St. John's Wood, u.t. 86 yrs., g.r. 6*l.*, r. 48*l.*, 420*l.*; 46, Huntley-st., Tottenham Court-rd., u.t. 16 yrs., g.r. 7*l.* 15s., r. 80*l.*, 470*l.*; 5, Grafton-st., u.t. 16 yrs., g.r. 7*l.* 15s., r. 60*l.*, 455*l.*; 1, Portsea-pl., Connaught-sq., and stabling, u.t. 24 yrs., g.r. 10*l.*, 600*l.*; 22 to 30 (even), St. Anne-st., Limehouse, u.t. 472 yrs., g.r. 25*l.*, notice of dilapidations served, 75*l.*

MAY 2.—By *C. H. Brown*: 32, Park-st., Stoke Newington, u.t. 50 yrs., g.r. 2*l.* 15s., r. 31*l.* 4s., 260*l.*; 1 and 2, Laburnham Cottages; and plot of land, u.t. 21 yrs., g.r. 3*l.*, and l.g.r. of 2*l.* 5s., 300*l.*—By *Segrave, Browett, & Taylor*: The residence "Cawood," Cator-rd., Beckenham, u.t. 78 yrs., g.r. 12*l.* 10s., 810*l.*—By *Marler & Bonnell*: 18, Edith-grove, Brompton, u.t. 60 yrs., g.r. 6*l.* 10s. 3d., 500*l.*—By *Debenham, Tewson, & Co.*: 42, Lansdowne-cres., Notting Hill, f., r. 94*l.*, 1,850*l.*—By *Bailey, Son, & Vine*: Stabling, No. 24, Fitzroy-sq., and 2, Chester-rd., Highgate, u.t. 72 yrs., g.r. 18*l.*, 750*l.*; 88, Gloucester-rd., Regent's-pk., u.t. 59 yrs., g.r. 10*l.*, r. 75*l.*, 820*l.*; 233, Gloucester-rd., u.t. 58 yrs., g.r. 8*l.* 8s., r. 48*l.*, 415*l.*; 235, Gloucester-rd., u.t. 50 yrs., g.r. 8*l.* 8s., r. 50*l.*, 410*l.*; 239, Gloucester-rd. u.,t. 68 yrs., g.r. 6*l.* 6s., 400*l.*; 134, Gloucester-rd., u.t. 68 yrs., g.r. 7*l.* 16s., 900*l.*—By *W. Houghton*: F. residence, Hoe-st., Walthamstow, and (4 s.d. 12 p., 3,650*l.*; 1, Fairmount-ter., Leytonstone, f., 16*l.*; 20, Church Hill-rd., Walthamstow, f., r. 32*l.*, 360*l.*; 21, 23, Oakhurst Grove, Dulwich, u.t. 83 yrs., g.r. 18*l.* 18s., r. 75*l.*, 485*l.*; 45, 47, and 51, Oakhurst-grove, u.t. 85 yrs., g.r. 30*l.*, r. 105*l.*, 690*l.*; 36 to 41, Nutfield-rd., u.t. 72 yrs., g.r. 24*l.*, 640*l.*; 36, West Hill, Sydenham, u.t. 58 yrs., g.r. 10*l.* 10s., r. 85*l.*, 630*l.*; 19, Linden-grove, Peckham, u.t. 55 yrs., g.r. 7*l.*, r. 55*l.*, 350*l.*; 15, Larkhall Rise, Clapham, u.t. 69 yrs., g.r. 2*l.* 19s. 6d., r. 80*l.*, 730*l.*

MAY 3.—By *T. A. Turner*: 10, Little North-st., Marylebone, u.t. 28 yrs., g.r. 4*l.*, r. 25*l.*, 180*l.*—By *Arnolds & Eason*: F.g.r. of 6*l.*, Gun-st., Bishopsgate-st., reversion in 65 yrs., 130*l.*; 71, Whitecross-st., Barbican, f., r. 5*l.*, 60*l.*; 13, 14, and 15, Red Lion Market, f., r. 6*l.* 16s., 590*l.*—By *A. Barton*: 21 to 24, James-pl., Stepney, f., 280*l.*—By *Nicholson & Son*: 48, Cooper's-rd., Old Kent-rd., f., r. 36*l.*, 395*l.*; 10, Mawbey-rd., f., 350*l.*—By *Protheroe & Morris*; "The Forest Nursery," Reindeer Lane, Buckhurst Hill, f., 330*l.*—By *Rushworth & Stimens*: 11 to 22, Rock-av., Fulham-rd., u.t. 84 yrs., g.r. 6*l.*, 1,200*l.*; 3, 4, 5, Station-rd., Wood Green, f., r. 61*l.*, 290*l.*; 2 and 4, High-st., Clapham, f., r. 186*l.* 10s., 1,520*l.*; No. 424, Clapham-rd., f., r. 75*l.*, 940*l.*

MAY 4.—By *Messrs. Chadwick*: 76, Redcliffe-gardens, Kensington, u.t. 59 yrs., g.r. 25*l.*, 1,470*l.*; f.g.r. of 42*l.*, Grove-pk., Denmark-hill, reversion in 94 yrs., 1,125*l.*; f.g.r. of 75*l.*, ditto in 91 yrs., 2,000*l.*; f.g.r. of 75*l.*, ditto in 90 yrs., 1,950*l.*; f.g.r. of 34*l.* 13s., ditto in 94 yrs., 945*l.*; f.g.r. of 50*l.*, Graigallion Gardens, reversion in 94 yrs., 1,360*l.*; f.g.r. of 50*l.*, ditto in 94 yrs., 1,350*l.*; f.g.r. of 100*l.*, ditto in 94 yrs., 2,660*l.*; f.g.r. of 40*l.*, Grove-pk., reversion in 94 yrs., 1,040*l.*; and i.r. of 190*l.*, New Burlington-st., Regent-st., u.t. 14 yrs., 1,000*l.*—By *Newbon & Co.*: 4 and 5, Mortimer Market, Tottenham Court-rd., f., 315*l.*; "Prospect House," East End-rd., Finchley, f., 395*l.*; 2, Torriano-av., Camden-rd., u.t. 46 yrs., g.r. 7*l.*, r. 30*l.* 10s., 450*l.*; 45, 47, Winchester-st., Caledonian-rd., u.t. 47 yrs., g.r. 18*l.*, r. 79*l.*, 405*l.*; 158, 160, and 162, Caledonian-rd., u.t. 38 yrs., g.r. 30*l.*, r. 155*l.*, 1,105*l.*—By *Bloxam & Sons*: 87, Ackerman-rd., Brixton, u.t. 70 yrs., g.r. 8*l.* 10*l.*; 9, Dante-rd., Newington Butts, u.t. 57 yrs., g.r. 7*l.* 10*l.*, 265*l.*; 11, Anderson-st., Chelsea, u.t. 49 yrs., g.r. 10*l.*, r. 45*l.*, 480*l.*; f.g.r. of 40*l.*, Westow Hill, Norwood, reversion in 41 yrs., 1,230*l.*; f.g.r. of 18*l.*, ditto in 65 yrs., 620*l.*; f.g.r. of 10*l.*, Woodland-rd., reversion in 60 yrs., 375*l.*—By *Foster & Cranfield*: 2 and 4, Broxholme-rd., Walham Green, u.t. 86 yrs., g.r. 12*l.*, 460*l.*; 36 and 38, Barrington-rd., Brixton, u.t. 29 yrs., g.r. 12*l.*, 475*l.*; 130, Queen's-rd., Dalston, u.t. 28 yrs., no g.r., r. 35*l.*, 270*l.*—By *Worsfold & Hayward* (at Dover): "The Red Lion," Denton, Kent, f., 1,300*l.*; five freehold cottages, Ewell, 300*l.*; two freehold cottages, 285*l.*; 1 and 2, Brook cottages, f., 305*l.*; "Brook House," f. 99*l.*; an enclosure of C meadow land, 72*l.*

MAY 5.—By *Henry & Latchford*: 34, Broadhinton-rd., Clapham, u.t. 50 yrs., g.r. 5*l.*, r. 30*l.*, 280*l.*—By *J. H. Bethell*: 62 to 76, St. Mary's-rd., Barking, f., 1,090*l.*; 2, 4, and 8, Fry-rd., Upton-pk., f., 600*l.*—By *A. H. Turner & Co.*: "Putney Park Lodge," Barnes, and 1¼ acres, u.t. 59 yrs., g.r. 25*l.*, 1,810*l.*—By *A. & A. Field*: "Lillybank," Hillside-rd., Tulse Hill, u.t. 83 yrs., g.r. 20*l.*, r. 65*l.* 400*l.*; 22, Nottingham-st., Bethnal Green, u.t. 25 yrs., g.r. 7*l.*, 135*l.*; 2 to 14 (even), Sainsbury-st., u.t. 31 yrs., g.r. 21*l.*, 1,155*l.*; No. 164, Stockwell-rd., and 16, Garden-row, f., r. 56*l.* 18s., 635*l.*; 23, 24, 25, Beulah-cres., Thornton Heath, f., r. 78*l.*, 620*l.*—By *Baker & Sons*: "Old House Farm," near Broxbourne, and 132 a. 1 r. 3 p., f., 2,900*l.*; 12, Laurel-ter., Catford, u.t. 94 yrs., g.r. 7*l.*, 125*l.*; f.g.r. of 100*l.*, Bulstrode-rd. West, Hounslow, reversion in 62 yrs., 2,400*l.*; f.g.r. of 33*l.*, Lampton-rd., reversion in 92 yrs., 560*l.*; eleven plots of f. land, Cromer, 293.—By *Tuffin & Harding*: 19 to 35 (odd), Stoke Newington-rd., Stoke Newington, f., r. 329*l.*, 5,760*l.*; 43 to 59 (odd), Stoke Newington-rd., f., r. 383*l.*, 6,420*l.*; 87 and 89, Stoke Newington-rd., f., r. 145*l.*, 2,850*l.*; 61 to 85 (odd), Stoke Newington-rd., f., r. 723*l.* 3s. 4d., area 10 a., 25,000*l.*

[*Contractions used in these Lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

PRICES CURRENT OF MATERIALS.

TIMBER.

Greenheart, B.G.	ton	9/0/0 to 0/0/0
Teak, E.I.	load	9/0/0 15/0/0
Sequoia, U.S.ft.cu.		2/3 2/6
Ash, Canada	load	2/15/0 4/5/0
Birch, do.		2/15/0 3/15/0
Elm, do.		3/15/0 4/15/0
Fir, Dantsic, &c.		1/10/0 3/5/0
Oak, do.		3/5/0 5/10/0
Canada		5/10/0 7/0/0
Pine, Canada red		2/15/0 3/15/0
Do. Yellow		2/10/0 4/10/0
Lath, D'ntsic, fath		4/10/0 5/10/0
St. Petersburg..		5/0/0 6/10/0
Deals, Finland		
2nd & 1st std	100	7/0/0 9/10/0
Do. 4th & 3rd	..	6/10/0 7/0/0
Do. Riga	.....	6/10/0 8/0/0
St. Petersburg, 1st yellow	....	10/0/0 14/0/0
Do. 2nd yellow	..	8/0/0 9/0/0
Do. white	.....	8/0/0 10/0/0
Swedish	.....	7/10/0 16/0/0
White Sea	.....	8/0/0 16/0/0
Canada, Pine	1st	21/0/0 28/10/0
Do. do.	2nd	16/0/0 17/10/0
Do. do.	3rd &c.	7/10/0 10/5/0
Do. Spruce,	1st	8/10/0 11/0/0
Do. do.	3rd & 2nd	6/10/0 8/0/0
New Brunswick		6/10/0 7/10/0
Battens, all kinds		3/0/0 15/0/0
Flooring boards, sq., 1 in. prep.		
1st	.....	0/9/6 0/16/6
Do. 2nd	.....	0/8/0 0/12/0
Other qualities—		0/4/6 0/7/6
Cedar, Cuba	..ft.	/4 /4½
Honduras,	..&c	/4 /4½
Mahogany, Cuba		/4 /6½
St. Domingo, cargo av.		/4 1/6
Mexican do. do.		/3½ /4½
Tobasco do. do.		/3½ /6½
Honduras do.	..	/4½ /6
Box, Turkey	ton	4/0/0 13/0/0
Rose, Rio	.....	9/0/0 20/0/0
Bahia	.....	8/0/0 18/0/0
Satin, St. Domingo	.....ft.	0/0/6 0/1/3
Porto Rico	.....	0/0/7 0/1/6

TIMBER (*continued*).

Walnut, Italian	..	0/0/3½ 0/0/7

METALS.

Iron—Pig, in Scotland	.....ton	2/0/6 0/0/0
Bar, Welsh, in London	.... ..	5/17/6 6/0/0
Do. do. at works in Wales	.....	5/7/6 5/10/0
Do. Staffordshire, in London	.....	6/0/0 6/10/0
COPPER—British, cake and ingot		47/5/0 47/15/0
Best selected	..	48/10/0 49/0/0
Sheets, strong	..	56/0/0 57/0/0
Chili, bars	.....	44/1/3 44/8/9
YELLOWMETAL	lb	0/0 4 13-16 /0/5
LEAD—Pig, Spanish	.....ton	9/12/6 9/15/0
English com. brands	.....	9/15/0 0/0/0
Sheet, English, 6 lbs. per sq. ft. and upwards	....	11/0/0 0/0/0
Pipe	.....	11/10/0 0/0/0
ZINC—English sheet	.....ton	22/0/0 0/0/0
Vieille Montagne	.....	22/10/0 0/0/0
TIN—Straits	.. ....	92/5/0 92/15/0
Australian	.....	92/17/6 93/7/6
English Ingots	..	96/0/0 96/10/0
Banca	.....	92/15/0 93/0/0
Billiton	..... .	92/0/0 92/5/0

OILS.

Linseed	.....ton	19/10/0 19/15/0
Cocoanut, Cochin		28/10/0 0/0/0
Do. Ceylon	.....	26/15/0 27/0/0
Palm, Lagos	.....	27/0/0 0/0/0
Rapeseed, English pale	.....	25/0/0 25/10/0
Do. brown	.....	23/15/0 24/0/0
Cottonseed ref.	...	21/10/0 0/0/0
Oleine	.....	22/0/0 24/0/0
Lubricating, U.S.		4/0/0 5/0/0
Do. refined	.....	5/10/0 12/0/0
TAR—Stockholm	barrel	0/18/6 0/0/0
Archangel	.....	0/12/6 0/0/0

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays.*]

ABERDEEN.—Accepted for the erection of boundary walls, &c., Woodside Public Park, for the Corporation. Mr. Wm. Dyack, surveyor, Town House, Aberdeen:—
Robertson & Cormack, Woodside £630 16 6

ABERSYCHAN (Wales).—For the erection of class-rooms, &c., for the Trevethin School Board. Mr. E. A. Lansdowne, architect, Newport, Mon. Quantities by the architect:—
John Morgan, Blaenavon* £1,027 0 0
* Lowest of four tenders. Accepted subject to approval of the Education Department.

BARNSTAPLE.—For the erection of shop and premises, 12, High-street, for the Feoffees of Barnstaple Long Bridge. Mr. Fredk. W. Petter, architect and surveyor, Bridge-buildings, Barnstaple:—

Wakeley & Hill	£1,996	J. Thorne	£1,615
J. Hancock	1,790	Wm. Sanders & R. Ridge	1,598
H. Slee and H. Sillifant	1,650	Hy. Burgess	1,595
J. Kerslake	1,640	Wm. Garland & Sons (accepted)	1,550
Wm. Cooke	1,629		

[All of Barnstaple.]

BELFAST.—For the construction of a low-level sewer under the river Lagan, &c., for the Corporation. Mr. J. C. Bretland, City Surveyor, Town Hall, Belfast. Quantities by Mr. W. H. Stephens, 41, Donegall-place:—

Fitzpatrick Bros., Ltd.	£14,000	H. & J. Martin, Ltd., Ormeau-road*	£12,010
Jas. Henry	12,247		

[All of Belfast.]
* Accepted.

BRAINTREE.—Accepted for the erection of a cottage at the waterworks, Braintree, for the Braintree Local Board. Mr. J. H. Jevons, Surveyor, Braintree:—
G. Hunnable, Braintree £195 0 0
For Providing and Fixing Air-Vessel, &c.
Blakeborough & Son, Brighouse £52 9 0

BRISTOL.—For the erection of a Wesleyan chapel, Bishopston. Mr. Herbert J. Jones, architect, 12, Bridge-street, Bristol:—

Wm. Church	£3,584	Eastabrook & Sons	£3,245
Stephens, Bastow & Co., Limited	3,498	J. Perrott	3,189
G. Humphreys	3,489	E. Walters	3,174
J. E. Davis	3,456	W. Cowlin & Son	3,049
G. H. Wilkins	3,297	R. Wilkins & Sons*	2,980

* Accepted.
[All of Bristol.]

BUCKFASTLEIGH (Devon).—For the erection of a chapel-of-ease. Mr. C. G. S. Acock, architect, Bridgetown, Totnes:—

Brenton & Neal	£2,028 10 0	Jackson & Son	£1,485 15 6
Crocker & Son	1,790 0 0	A. Wakeham	1,483 9 6
Reeves & Selwood	1,609 0 0	Arscott & Jackson	1,480 13 0
Wakeham Bros.	1,591 0 0	H. Stevens	1,478 0 0
S. Furneaux	1,492 16 6	J. Foaden	1,470 9 0

CARLISLE.—Accepted for additions to houses, Botcherby, Carlisle. Mr. Herbert H. Hodgkinson, architect, Carlisle:—

Builder.—G. Hill, Carlisle	£99 0	*Plasterer.*—R. M. Ormerod, Carlisle	£25 0
Joiner.—W. Wilson, Carlisle	25 15		

CHARMINSTER (Dorset).—For the construction of a reservoir (to hold 250,000 gallons) and works appertaining thereto, for the Visiting Committee of the County Lunatic Asylum. Mr. G. T. Hine, engineer, 35, Parliament-street, Westminster, S.W.:—

Wilkinson & Co.	£670	Patent Paving Construction Company	£482
Pethick Brothers	584	Harvey, Charminster*	445
Love, Ayles, & Son	535		

* Accepted.

CORK.—For the construction of a reservoir for the Union Guardians, Mr. Coakley, engineer, 86, South Mall, Cork:—

D. Ford	£865	Rd. Longfield	£819
T. O'Flynn	821	Jas. Donoghue, Cork*	791

* Accepted.

DERBY.—For the execution of drainage works (three acres), Blackwell, pipes, sewers, &c., for the Mansfield Rural Sanitary Authority. Mr. H. Walker, engineer, Newcastle Chambers, Nottingham. Quantities supplied by the engineer:—

J. Fulcher	£508 10 6	J. Bradley	£378 12 0
F. Messon	491 0 0	Raynor & Cope	352 18 10
W. Pinkett	434 10 0	Hawley & Son, Ilkeston*	332 6 6
J. F. Price	402 12 0		
J. Lane	383 15 0		

*Accepted.
[Engineer's estimate ..... £330.]

DURHAM.—For alteration to premises, North-road, for the Trustees of the Shakespeare "British Workman." Mr. H. T. Gradon, architect, Framwell-gate Bridge, Durham:—

F. Caldcleugh	£693 0	J. Kell	£675 0
J. Shepherd	683 0	G. Gradon & Son	607 10
F. Gibson	682 0		

[All of Durham.]

ERITH (Kent).—For the erection of eight houses at Bladonwell, for Mr. W. Vinson. Mr. St. Pierre Harris, architect and surveyor 1, Basinghall-street, E.C.:—

G. Miles	£2,500 0 0	Strickland & Chandler	£1,922 18 10
F. Hind	2,313 0 0	C. Catlett*	1,785 0 0
A. Osborne & Co.	1,990 0 0		
T. Knight	1,989 0 0		

* Accepted in a modified form.

FARNBOROUGH (Kent).—For the erection of Parish Room for the Vicar. Mr. St. Pierre Harris, architect and surveyor, 1, Basinghall-street, E.C.:—

Gregory & Co.	£777	Osborne & Co.	£625
T. Crossley	634	W. Owen	500

GODALMING.—For main drainage of the contributory districts. Mr. Henry Moon, Surveyor for the Northern, and Mr. S. Welman, Surveyor for the Southern, District:—

	North.	South.
B. Cooke & Co.	£12,159	£10,934
J. Band	11,000	7,909
W. Cunliffe, Kingston-on-Thames*	10,090	7,327
T. P. Hall	10,065	7,337

* Accepted for both districts.

HEMEL HEMPSTEAD.—For additions and alterations to the Vicarage, Hemel Hempstead. Mr. C. L. R. Tudor, architect, 81, Lancaster-road, Notting Hill. Quantities by Mr. C. J. Ford, 4, Mitre-court, Fleet-street, E.C.:—

F. Gladwell	£891 10	Waterman	£794 0
Sears	806 0	Moody	723 0

HOUND (Hants).—For the enlargement of the boys' school for the Hound School Board. Messrs. W. H. Mitchell, Son, & Gutteridge, architects, Southampton:—

H. Carden	£717	H. Cawte	£607
C. & A. Witt	615	H. Stevens & Co., Southampton (accepted)	598
J. Hinton	610		

KILMALLOCK (Ireland).—For the erection of a labourer's cottage, Clonkeen, for the Union Guardians. Mr. John Carrol, architect, Kilmallock:—

John Riely	£118	James Murphy, Cooline	
Edward Morrisy	116	Charleville (accepted)	£11

LONDON.—For erecting a cookery centre in connexion with the Baker-street School, Stepney, for adapting the old building in the girls' playground for a laundry centre, and for other works, for the School Board for London. Mr. T. J. Bailey, Architect:—

W. M. Dabbs	£3,133 0	J. Smith & Sons	£2,611 0
F. & H. F. Higgs	3,037 0	McCormick & Sons	2,556 0
J. Longley & Co.	2,991 0	J. Willmott & Sons	2,460 0
Johnson & Co.	2,969 12	Co-operative Builders, Limited, Brixton*	2,398 0
F. J. Coxhead	2,799 0		

* Recommended for acceptance by the Works Committee.

LONDON.—For enlarging the Infants' department of the Galley wall-road School, Bermondsey, by 45 places, and for other works for the School Board for London. Mr. T. J. Bailey, Architect:—

J. Allen & Sons	£2,845	D'Oyly & Co.	£2,480
Drew & Cadman	2,665	W. Antill & Co.*	2,40
S. Yardley & Sons	2,510		

*Accepted.

Gas Fittings.

Vaughan & Brown (accepted) £50 0 0

Electric Light Fittings.

Vaughan & Brown (Accepted) £275 0 0

Pewterers' Work.

J. Edwards	£492	Sanders & Son	£413
T. Heath	475	Watts & Co.	409
W. Helling	467		

LONDON.—For paving and making-up Musgrave-crescent (Sections 1 and 2), for the Fulham Vestry. Mr. W. Sykes, New Streets Surveyor, Town Hall, Walham Green, London, S.W.:—

	Musgrave-crescent, Sec. 1.				Musgrave-crescent, Sec. 2.			
	Roadway.	York.	Patent Adamant.	Imperial.	Roadway and Tar Paving.	York.	Patent Adamant.	Imperial.
Nowell & Robson	270	50*	—	—	473	111	—	—
E. Rogers & Co.	233	—	—	—	435	105†	—	—
E. Parry	265	—	—	—	—	—	—	—
G. Wimpey & Co.	233	—	37	—	412	109	77	—
H. J. Greenham	275	—	—	—	475	—	—	—
Imperial Stone Co.	—	—	—	38	—	—	—	79

* Tenders not invited for York stone.
† If roadway tender not accepted—£120.

LONDON.—For providing and fixing heating apparatus on the low pressure hot-water system, with the necessary boilers, for the new schools now in course of erection on the sites in Gayhurst-road, South Hackney, and Sussex-road, Coldharbour-lane, Brixton, for the School Board for London. Mr. T. J. Bailey, Architect:—

Gayhurst-road, Hackney.

T. Potter & Sons	£597 0	Rosser & Russell	£450 0
G. Davis	470 0	J. & F. May	433 0
Comyn, Ching, & Co.	464 10	J. F. Clarke & Sons	391 0
J. C. & J. S. Ellis	462 15	Purcell & Nobbs, Fitzroy-square*	343 0
A. M. Perkins & Co.	461 10		

Sussex-road, West Lambeth.

Z. D. Berry & Sons	£398 10	J. & F. May	£370 15
Rosser & Russell	394 0	C. P. Kinhell & Co., Southwark-street, S.E.*	355 0
W. G. Cannon	375 0		

* Recommended by the Works Committee for acceptance.

LONDON.—For providing and fixing heating apparatus on the low-pressure hot-water system, with the necessary boilers, for the enlargements of the Waldron-road School, Tooting, and the Harrow-road School, Paddington, which are now in course of erection, and also for connecting the new apparatus to the existing apparatus in these buildings, for the School Board for London. Mr. T. J. Bailey Architect:—

Waldron-road, West Lambeth.

T. Potter & Sons	£352 0 0	Z. D. Berry & Sons, Westminster*	£179 5 0
Wilson Engineering Company	260 0 0		

Harrow-road, Marylebone.

T. Potter & Sons	£485	W. G. Cannon	£285
Wenham & Waters	416	G. Davis, Silver-street, Kensington*	275
Comyn, Ching & Co.	295		
J. & F. May	295		

* Recommended by the Works Committee for acceptance.

LONDON.—For new fittings for the "Horse-Shoe" Tavern, Tottenham Court-road, W.C., for Messrs. Baker Bros., Ltd. Messrs. Saville & Martin, architects, Dacre House, Arundel-street, Strand, W.C. Quantities supplied:—

Bar Fittings.

J. Allen & Sons	£2,845	D'Oyly & Co.	£2,480
Drew & Cadman	2,665	W. Antill & Co.*	2,40
S. Yardley & Sons	2,510		

*Accepted.

Gas Fittings.

Vaughan & Brown (accepted) £50 0 0

Electric Light Fittings.

Vaughan & Brown (Accepted) £275 0 0

Pewterers' Work.

J. Edwards	£492	Sanders & Son	£413
T. Heath	475	Watts & Co.	409
W. Helling	467		

LONDON.—For new roads, sewers, &c., on the Chiswick Estate, for the British Land Company, Limited. Mr. Henry B. Michell, surveyor, 25, Moorgate-street, E.C. :—

Nowell & Robson	£1,650	Pizzey	£1,282
Killingback	1,430	Ball	1,210
Cronin	1,400	Wilson	1,186
Peill & Sons	1,300	Rhodes, Chiswick*	1,114
Rogers	1,296		

* Accepted.

LONDON.—For additions to Normand House, Fulham, S.W. Mr. C. L. R. Tudor, architect, 81, Lancaster-road, Notting Hill. Quantities by Mr. C. J. Ford, 4, Mitre Court, Fleet-street, E.C. :—

Higgs & Hill	£1,184 0	Soger	£958 18
Woodward	1,107 0	Nash	900 0
Hollingsworth	1,030 0	Knight	890 0

LONDON.—For erecting a laundry centre in connexion with the St. Paul's-road School, Bow Common, and for other works, for the School Board for London. Mr. T. J. Bailey, Architect :—

F. J. Coxhead	£840	Norris & Luke	£708
J. Garrett & Son	769	Rice & Son	684
G. S. S. Williams & Son	744	Lathey Bros.	659
J. Smith & Sons	714	E. Triggs, Clapham*	635

* Recommended by the Works Committee for acceptance.

LONDON. — For pulling down and rebuilding the "Prince Regent" public-house, Regent-street, and two houses adjoining, in Doris-street, Lambeth, for Mr. George Evans. Mr. W. M. Brutton, architect, 171, Queen Victoria-street, E.C. :—

Dearing & Son	£4,108	William Smith	£3,454
Pritchard & Renwick	3,700	Godson & Son	3,404
Burman & Son	3,572	Edwards & Medway, Lambeth*	3,390
Whitehead & Co.	3,560		
Hart Bros.	3,500		

* Accepted.

LONDON.—For alterations to the "Two Brewers" public-house, Goswell-road, E.C., for Mr. Pannifer. Mr. W. M. Brutton, architect, 171, Queen Victoria-street, E.C. :—

Pritchard & Renwick	£742	Whitehead & Co.	£645
S. Archer	685	F. Granfield	540

LONDON.—For building new skittle-alley at the "Olive Branch" beer-house, Southampton-street, Camberwell, S.E., for the New London Brewery Co., Lim. Mr. W. M. Brutton, architect, 171, Queen Victoria-street, E.C. :—

Wm. Rowe	£210	— Knight	£157
T. Hooper	169	Whitehead & Co. (accepted)	154

LONDON.—Accepted for alterations to dining-rooms, Broadway, Stratford, E., for Mr. Smith. Mr. W. M. Brutton, architect, 171, Queen Victoria-street, E.C. :—

Pritchard & Renwick £955

LONDON.—For alterations to the "Adam and Eve" public-house, High-street, Hoxton, for Mr. James Hall. Mr. W. M. Brutton, architect, 171, Queen Victoria-street, E.C. :—

Whitehead & Son, Clapham £352 0 0

LONDON.—Accepted for gasfittings to the "Crystal" public-house, Rotherhithe. Mr. W. M. Brutton, architect, 171, Queen Victoria-street, E.C. :—

Padbury & Whale £103 0 0

MATLOCK BRIDGE.—For the erection of police-buildings, lock-up, &c., for the Standing Joint Committee of the Derbyshire County Council. Mr. J. Somes Story, County Surveyor, Market-place, Derby :—

Bramwell	£1,568 11	Walkerdine	1,350 0
Hingley	1,440 0	Askew	1,330 0
Walker & Son	1,400 0	Wildgoose, Matlock Bank*	1,239 0
Knowles & Son	1,379 0		
Brown	1,364 15		

* Accepted.

MORPETH.—Accepted for the erection of twenty-eight houses, Togstone-terrace, for the Togstone-terrace and Broomhill Co-operative Society, Limited. Messrs. Boolds & Hardy, architects, 25, Bridge-street, Morpeth :—

Messrs. T. & J. White, Shieldfield, Newcastle-on-Tyne* £4,640 0 0

* Lowest among several tenders.

ORPINGTON (Kent).—For making a new road at Orpington, Kent. Mr. St. Pierre Harris, Surveyor, &c., 1, Basinghall-street, E.C. :—

Osborne & Co.*	£200 8 0	W. P. Taylor	£174 16 10
Peill & Sons	190 5 4	T. Lansbury†	115 11 0

* Accepted in a modified form. † Withdrawn.

ORPINGTON (Kent).—For the erection of farm buildings. Mr. St. Pierre Harris, architect and surveyor, 1, Basinghall-street, E.C. :—

W. Owen	£164	Somerford & Son*	£159
Osborne & Co.	160		

* Accepted.

ROCHDALE.—Accepted at per schedule of prices for the sewering work required in Salkeld-street, Church-street, &c., for the Corporation of Rochdale. Mr. S. S. Platt, Borough Surveyor, Town Hall, Rochdale :—

Salkeld-street.—Joseph Lord, Platting-lane, Rochdale.
Church-street.—Fred Kershaw, Prince-street.

SOUTHAMPTON.—Accepted for the enlargement of infants' school buildings at Pear Tree Green, near Southampton, for the St. Mary-Extra School Board. Messrs. W. H. Mitchell, Son, & Gutteridge, architects, Southampton :—

W. H. Chapman, Woolston £894 0 0

SUTTON COLDFIELD.—For sewering (in part), levelling, kerbing, &c., Highbridge, and other roads and streets, for the Corporation. Mr. C. F. Marston, C.E., Sutton Coldfield :—

Highbridge-road, Contract No. 1.

Hughes & Son	£823 7 6	Jacob Biggs	£600 0 0
Cruwys & Hobrough	802 17 9	Currall and Lewis	676 0 0
Geo. Law	787 0 0	Jones & Fitzmaurice, Birmingham*	600 0 0
Jno. White, jun.	712 17 0		

* Accepted.

Highbridge-road Contract No. 2.

Hughes & Son	£1,965 16 9	Currall & Lewis	£1,695 0 0
Cruwys & Hobrough	1,891 17 7	Jacob Biggs	1,600 0 0
Geo. Law	1,823 0 0	Jones & Fitzmaurice Birmingham*	1,487 0 0
Jno. White, jun.	1,793 17 8		

* Accepted.

Station-road.—Contract No. 3.

Jno. White, jun.	£814 5 9	Currall & Lewis	£656 0 0
Hughes & Son	798 10 0	Jacob Biggs	650 0 0
Cruwys & Hobrough	752 5 9	Jones & Fitzmaurice, Birmingham*	568 0 0
Geo. Law	747 0 0		

* Accepted.

Station-road.—Contract No. 4.

Jno. White, jun.	£1,953 1 0	Jacob Biggs	£1,600 0 0
Cruwys & Hobrough	1,918 18 3	Hughes & Son	1,504 0 8
Geo. Law	1,803 0 0	Jones & Fitzmaurice, Birmingham*	1,515 0 0
Currall & Lewis	1,663 0 0		

* Accepted.

SWANLEY (Kent).—Accepted or the erection of seventeen houses at Swanley Junction, Kent. Mr. St. Pierre Harris, architect and surveyor, 1, Basinghall-street, E.C. :—

Stebbings & Pannett £3,127 0 0

WAKEFIELD.—For the construction of a main pipe-sewer (400 yards), Crofton Village; and another (360 yards) at Stanley Lane End, for the Union Rural Sanitary Authority. Mr. Frank Massie, C.E., Tetley House, Kirkgate, Wakefield :—

Crofton.		*Stanley.*	
Wilson Bros.	£268 18 5	Wilson Bros.	£124 10 2
Matt. Arundel	257 13 9	Matt. Arundel	137 17 6
Garforth Bros., Mirfield (accepted)	226 0 3	Garforth Bros., Mirfield (accepted)	110 14 9
Aliffe Bros.	193 0 3	Aliffe Bros.	97 19 10

WANSTEAD (Essex).—For making-up part of Spratt Hall-road, for the Local Board. Mr. John T. Bressey, Surveyor, Local Board Offices, Wanstead :—

Wm. Griffiths	£300	Jesse Jackson	£122
J. L. Cattell	272	Joseph Jackson, Forest Gate, E. (accepted)	100
Brewer & Rackham	250		
John Reeves	128		
[Surveyor's estimate	£106 0 0]		

WREXHAM.—For the erection of two semi-detached villa residences, Belgrave-road, for Mr. Jno. Burton. Messrs. J. Morison & Son, architects, 10, King-street, Wrexham :—

Rogers	£2,040	Davies & Son	£1,705
Samuel	1,740	Whittingham	1,683
Owen	1,740	Bradshaw, Gwersyllt*	1,650

*Accepted.

Villa Residences at Brockley.—Mr. Walter Barnett, of Winchester House, E.C., writes to say that he is not the architect of these residences, tenders for which appeared in our last issue, p. 357.

SUBSCRIBERS in LONDON and the SUBURBS, by prepaying at the Publishing Office, 19s. per annum (or 4s. 9d. per quarter), can ensure receiving "The Builder," by *Friday Morning's Post.*

TO CORRESPONDENTS.

W. G. S. (should have sent amounts).—J. B. McC. (ditto).—T. O'D. (too small).—H. C. (does not comply with our requirements).—B. & D. (ditto).—W. G. (we do not insert tenders without amounts).—H. L. (too late).—F. & H. F. H. (too late).—J. S. & Co. (too late).—M. Bros. (too late).

All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news-items) which have been duplicated for other journals, are NOT DESIRED.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

TERMS OF SUBSCRIPTION.

"THE BUILDER" is supplied DIRECT from the Office to residents in any part of the United Kingdom, at the rate of 19s. per annum PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, &c. 26s. per annum. Remittances (payable to DOUGLAS FOURDRINIER) should be addressed to the Publisher of "THE BUILDER," No. 46, Catherine-street, W.C.

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Advertisements for the current week's issue are received up to THREE o'clock p.m. on THURSDAY, but "Classification" cannot be guaranteed for any which may reach the Office after HALF-PAST ONE p.m. on that day. Those intended for the front Page should be in by TWELVE noon on WEDNESDAY.

SPECIAL.—ALTERATIONS IN STANDING ADVERTISEMENTS or ORDERS TO DISCONTINUE same must reach the Office before 10 a.m. on WEDNESDAY.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c., left at the Office in reply to advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

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Architects' Designs are carried out with the greatest care.

CONSERVATORIES,
GREENHOUSES,
WOODEN BUILDINGS,
Bank, Office, & Shop Fittings.
CHURCH BENCHES & PULPITS.

ESTIMATES GIVEN ON APPLICATION

The Builder Cathedral Series

1891.

*1. Canterbury	*Jan.* 3	*5. Wells	*May* 2	9. Norwich	*Sept.* 5
*2. Lichfield	*Feb.* 7	6. Exeter	*June* 6	10. Rochester	*Oct.* 3
*3. St. Alban's	*Mar.* 7	7. Salisbury	*July* 4	11. Lincoln	*Nov.* 7
*4. Peterboro'	*April* 4	8. Bristol	*Aug.* 1	12. Gloucester	*Dec.* 5

1892.

13. St. Paul's	*Jan.* 2	17. Llandaff	*May* 7	21. Bangor	*Sept.* 3
14. Hereford	*Feb.* 6	18. Oxford	*June* 4	22. St. Asaph	
15. Chichester	*Mar.* 5	19. Southwell	*July* 2	23. Winchester	*Oct.* 1
16. Ely	*April* 2	20. Worcester	*Aug.* 6	24. Truro	*Nov.* 5
		25. St. David's	*Dec.* 3		

1893.

*26. York	*Jan.* 7	28. Chester	*Mar.* 4	30. Carlisle	*May* 6
27. Ripon	*Feb.* 4	29. Manchester	*April* 1	31. Durham	*June* 3

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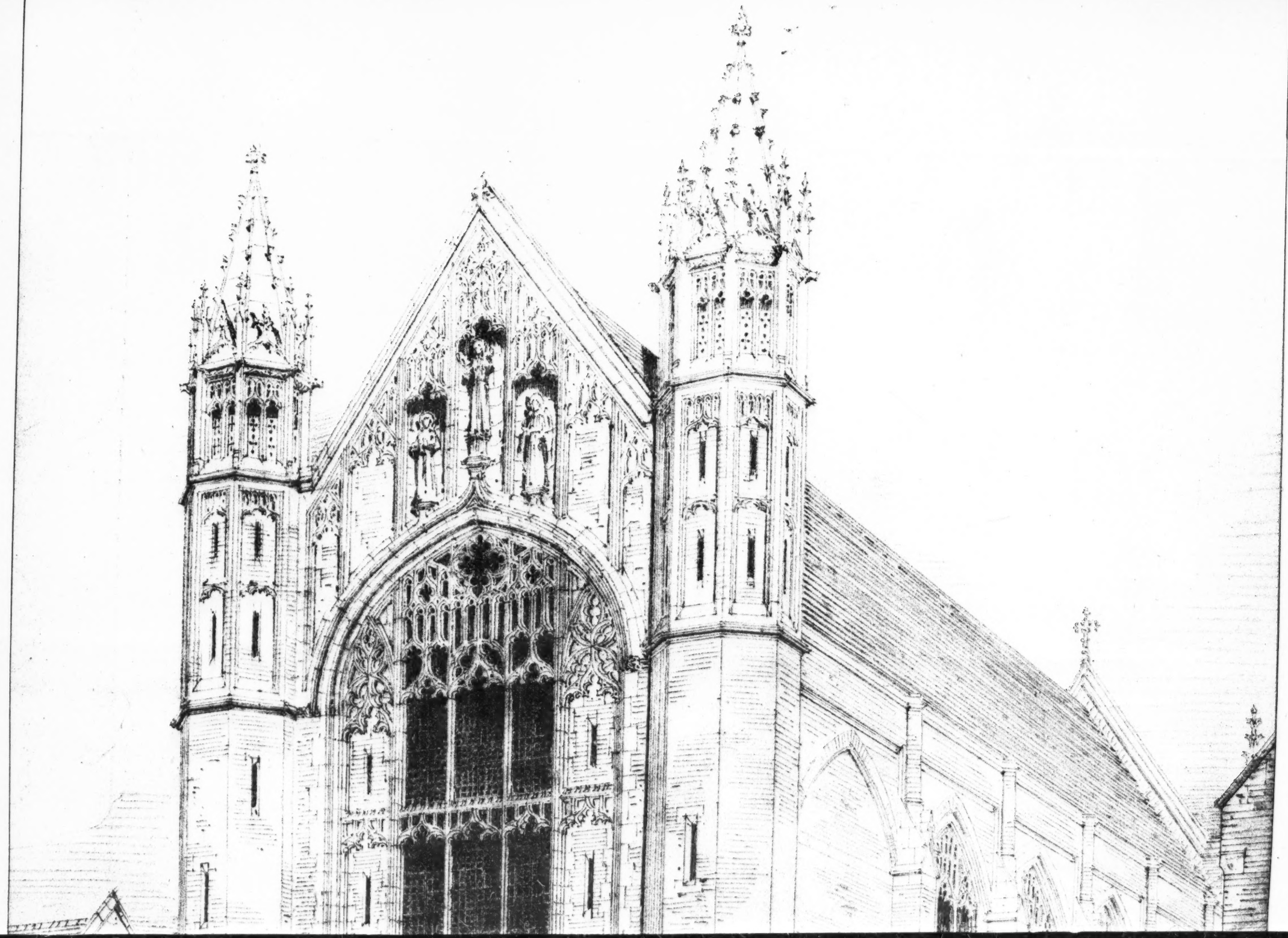

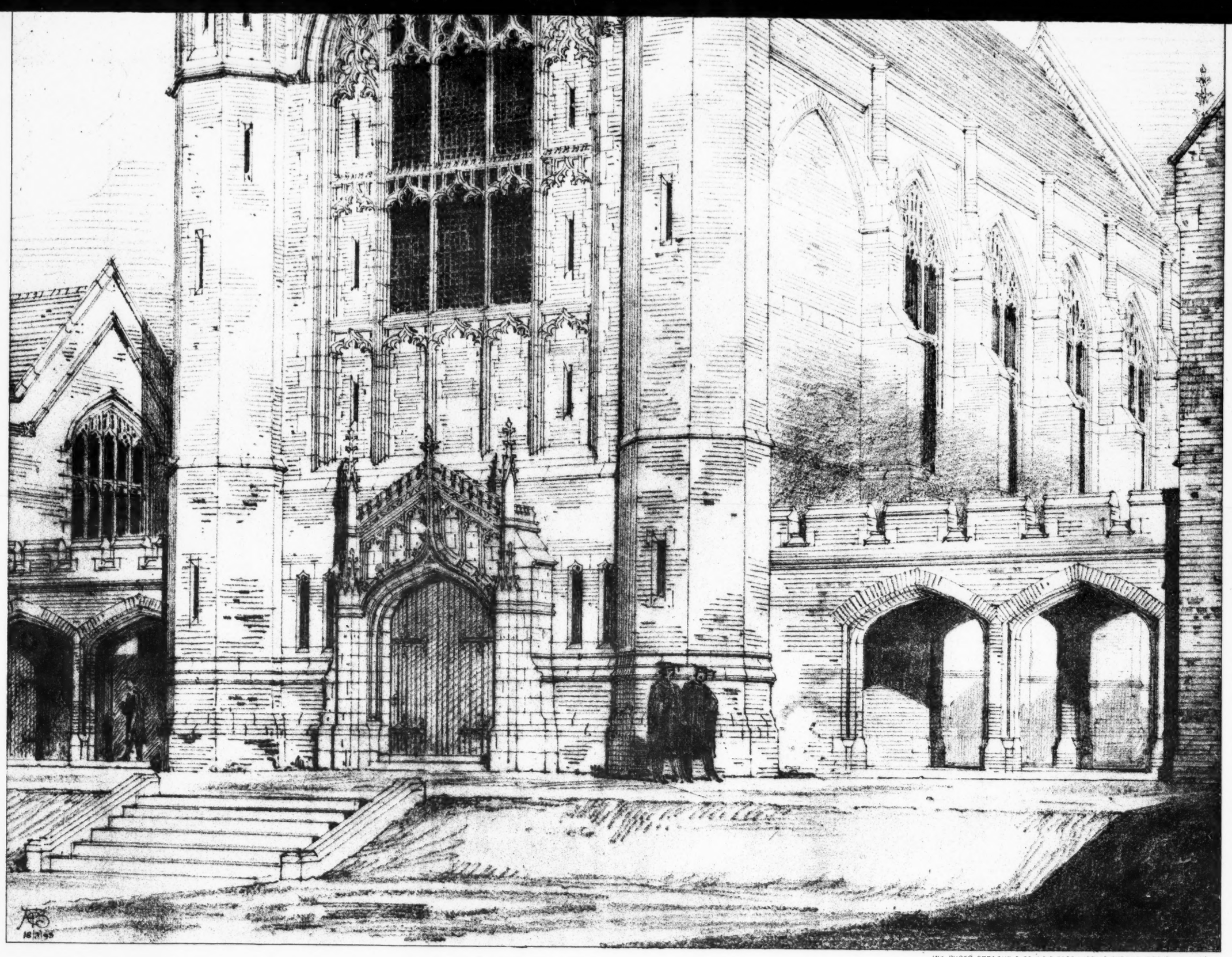

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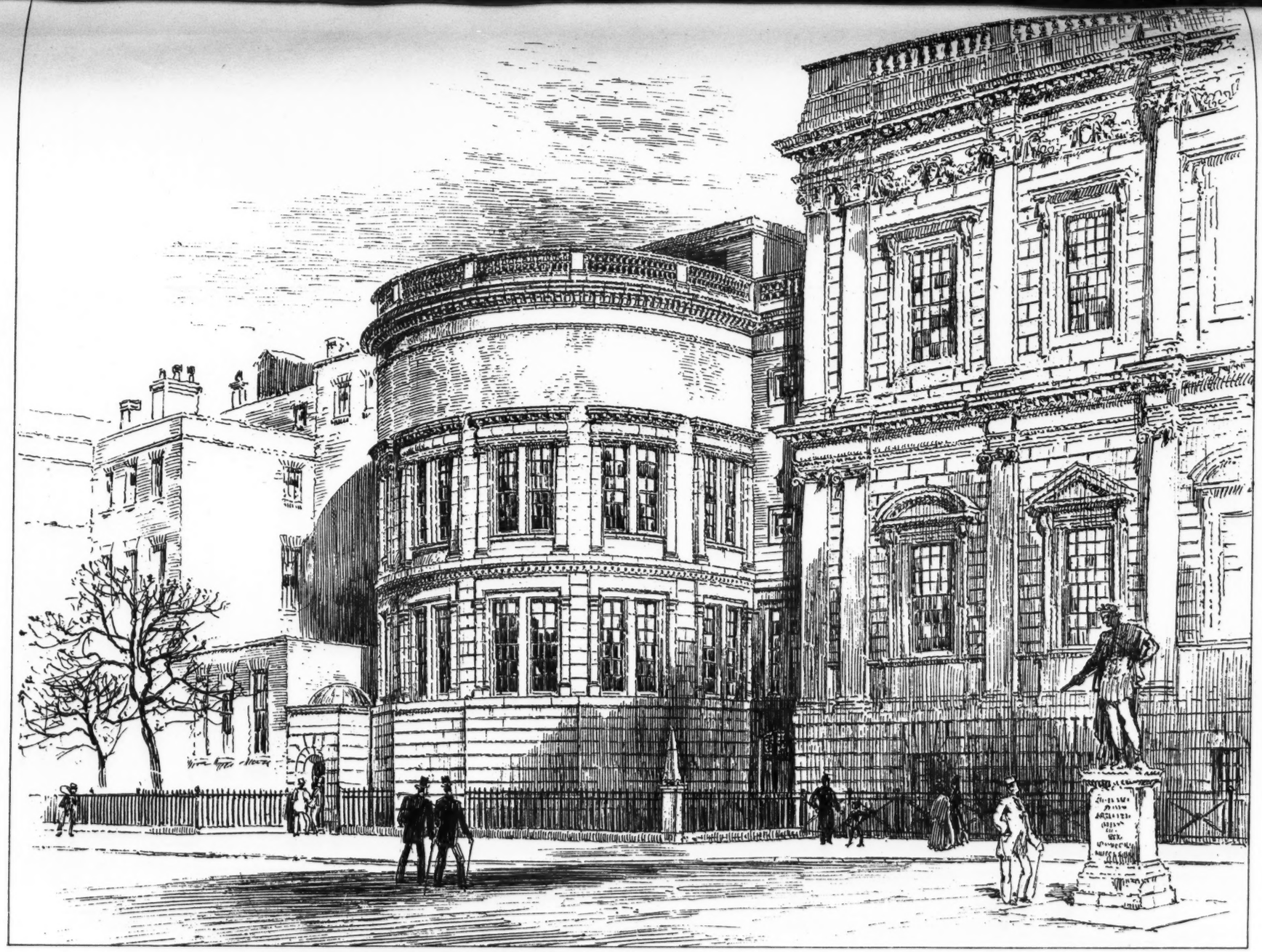

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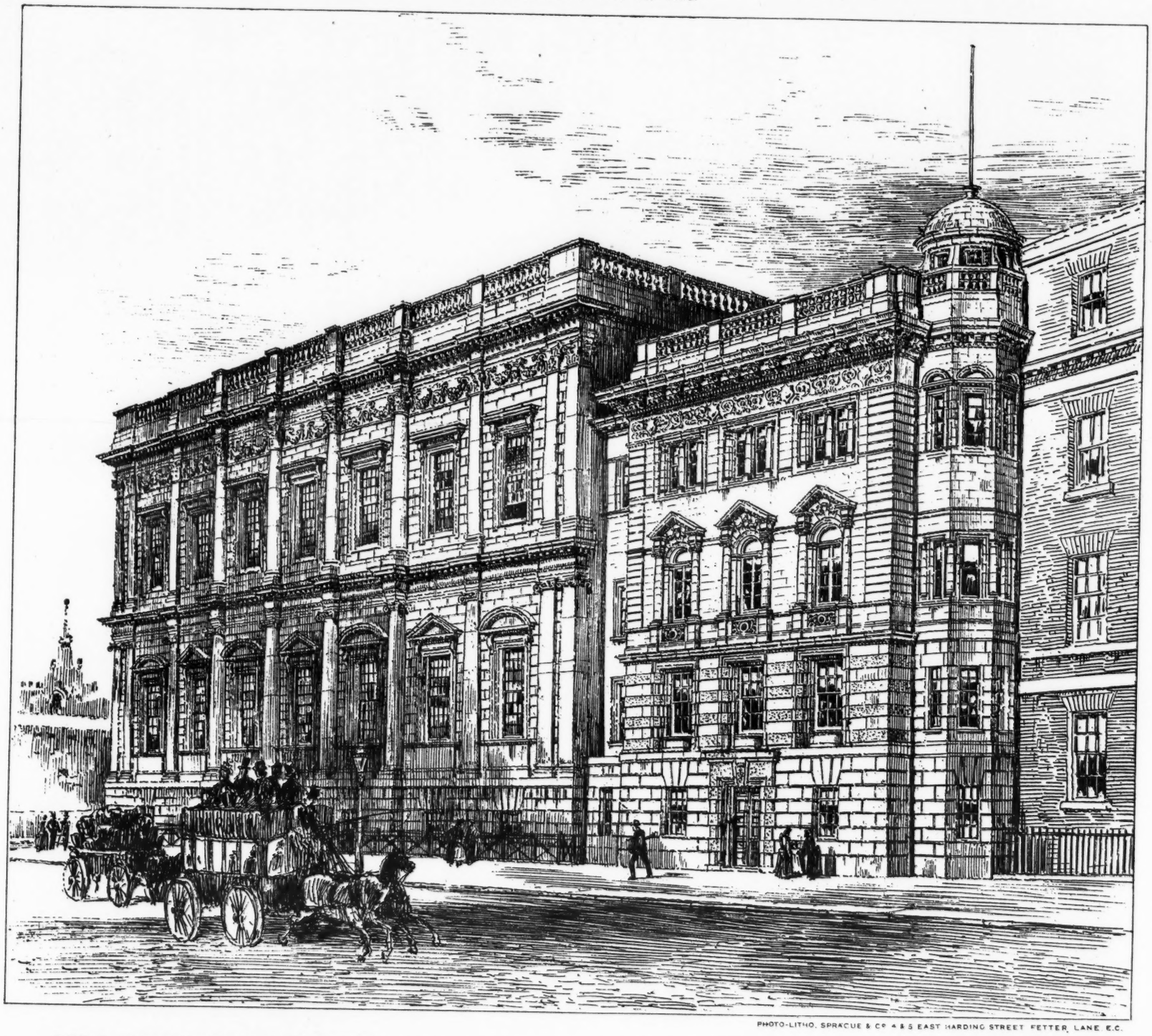

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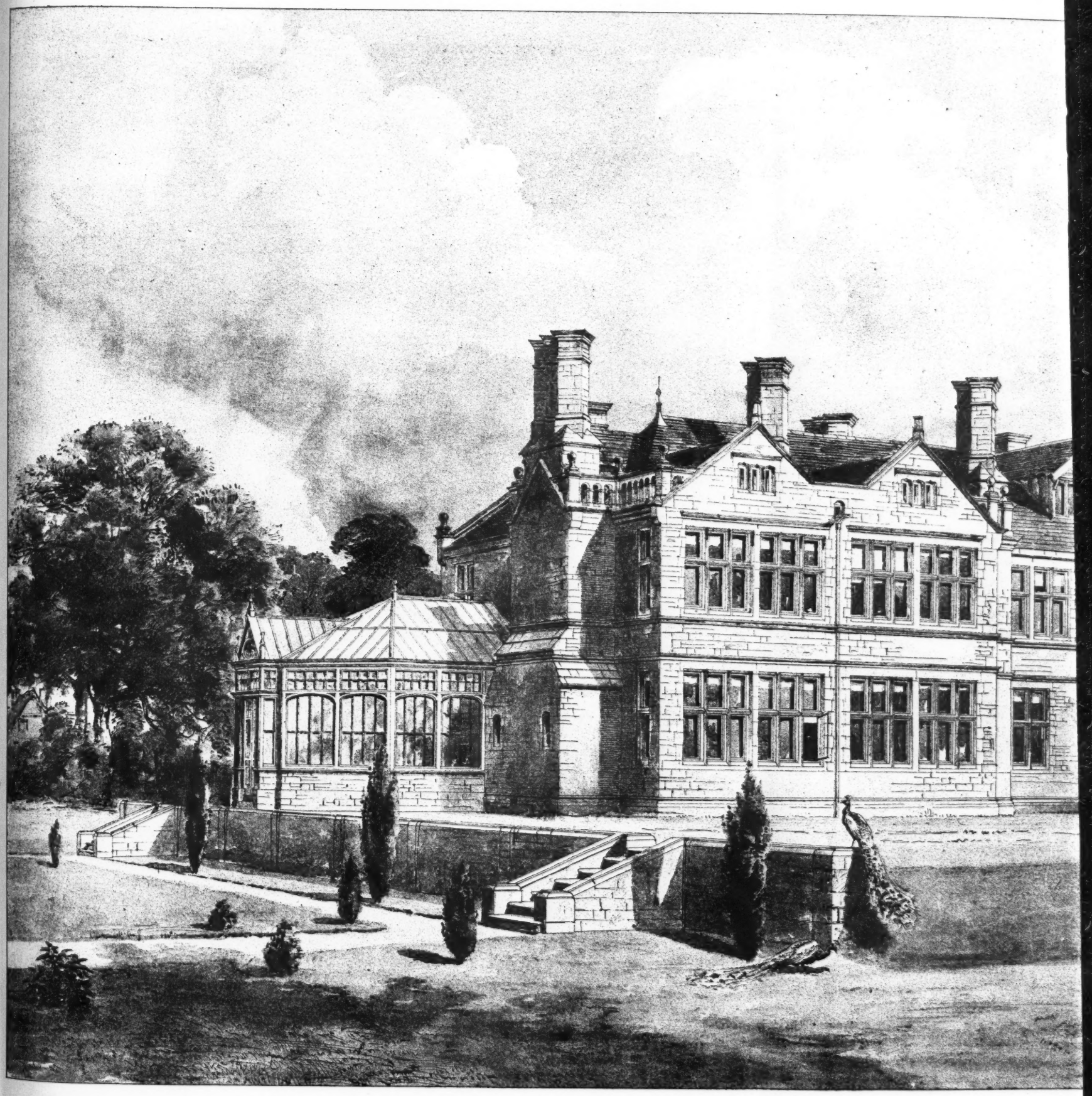

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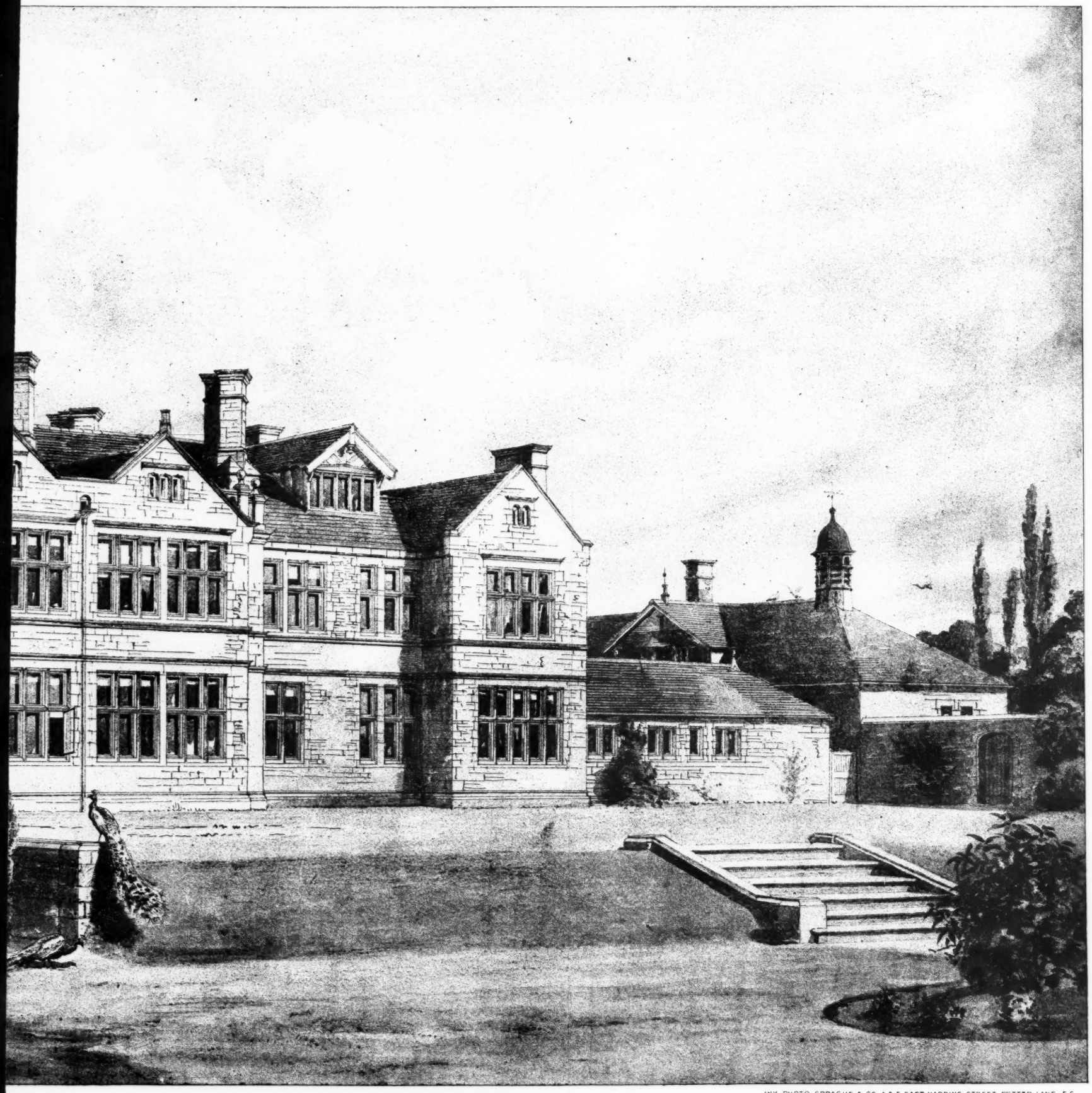

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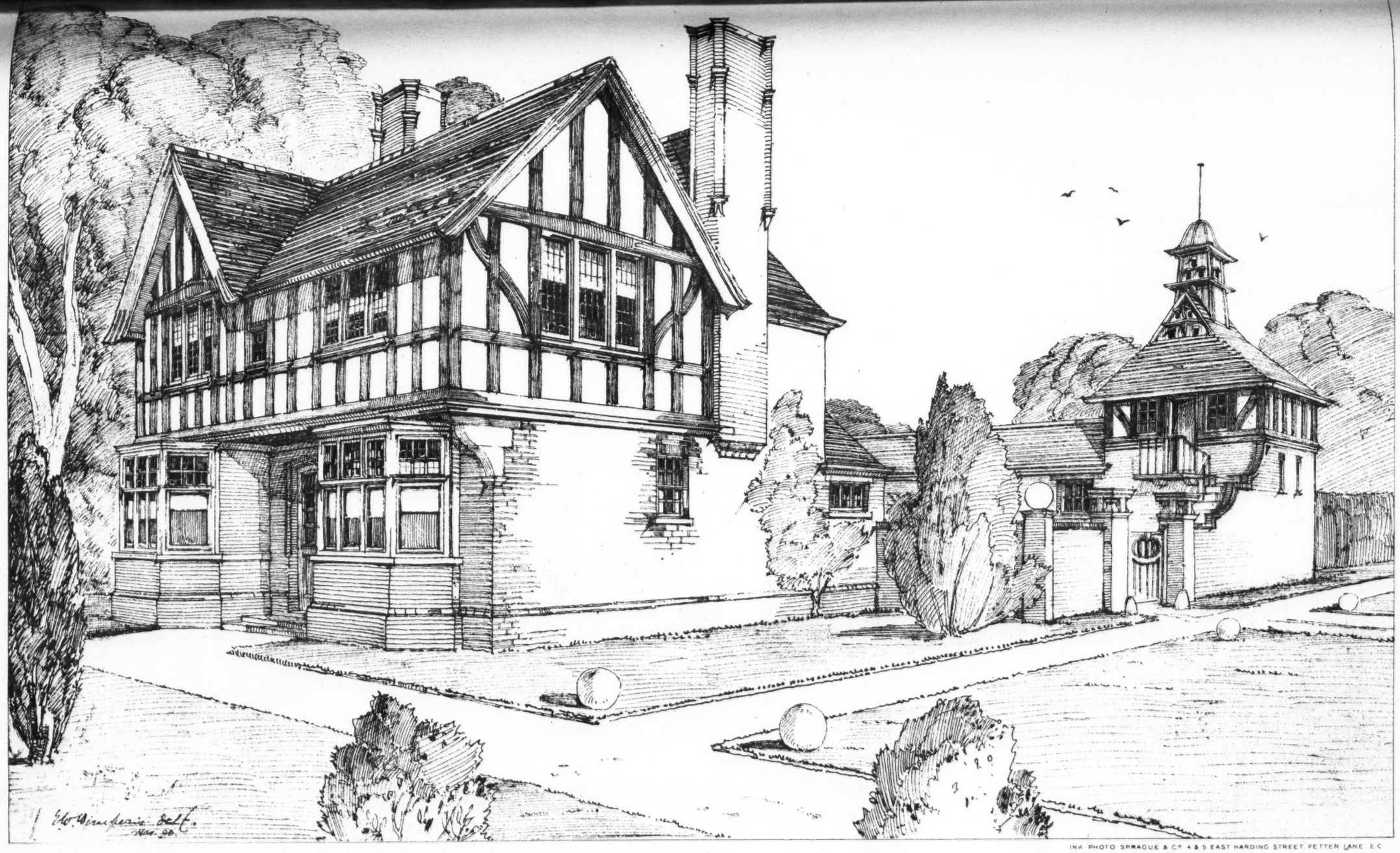

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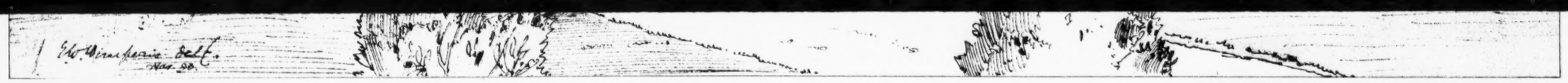

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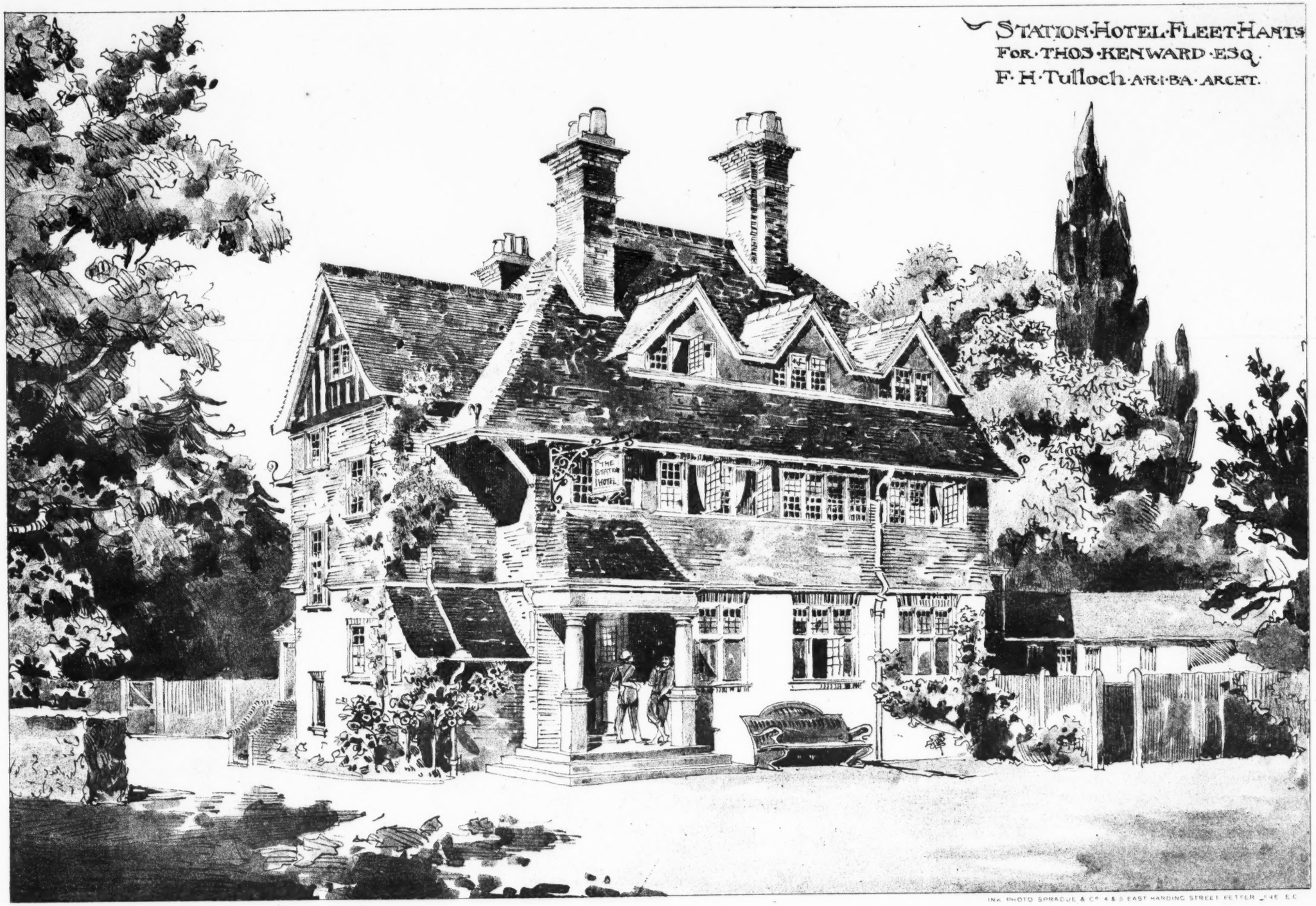

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